

AD-A273 436



Implementation Document **GROUNDWATER INTERCEPT and TREATMENT BASIN A NECK IR**

VOLUME 3/ENGINEERING DRAWINGS

Rocky Mountain Arsenal
Information Center
Commerce City, Colorado
Prepared by

MK-ENVIRONMENTAL SERVICES
Denver, Colorado

Prepared for



Shell Oil Company

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Information Document for
CEPT and TREATMENT SYSTEM
A NECK IRA

ENGINEERING DRAWINGS


Mountain Arsenal
Information Center
Greeley City, Colorado
Prepared by

ENVIRONMENTAL SERVICES
Greeley, Colorado

Prepared for



Oil Company

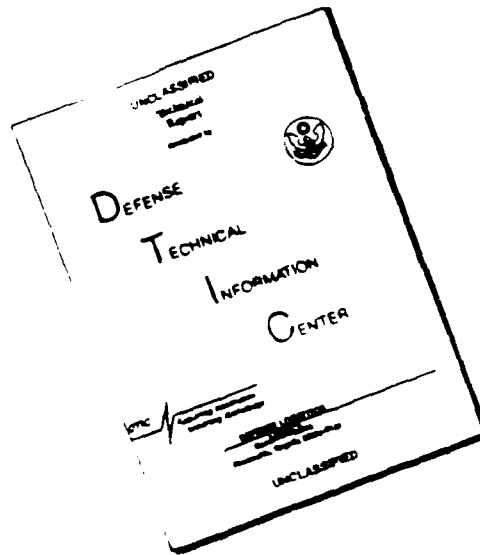
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REPORT DOCUMENTATION PAGE			Form Approved OMB No. 0704-0188 (2)	
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1. AGENCY USE ONLY (Leave blank)	2. REPORT DATE 08/00/89	3. REPORT TYPE AND DATES COVERED 1		
4. TITLE AND SUBTITLE IMPLEMENTATION DOCUMENT FOR GROUNDWATER INTERCEPT AND TREATMENT SYSTEM FOR BASIN A NECK, IRA		5. FUNDING NUMBERS		
6. AUTHOR(S)				
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) MORRISON-KNUDSEN ENGINEERS, INC.		8. PERFORMING ORGANIZATION REPORT NUMBER 89262R05		
9. SPONSORING / MONITORING AGENCY NAME(S) AND ADDRESS(ES) SHELL OIL COMPANY		10. SPONSORING / MONITORING AGENCY REPORT NUMBER		
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13. ABSTRACT (Maximum 200 words) THE BASIN A NECK INTERIM RESPONSE ACTION WILL CONSIST OF: 1. SEVEN DEWATERING WELLS 2. SOIL BENTONITE SLURRY WALL 3. GROUND WATER TREATMENT BY ACTIVATED CARBON 4. GRAVEL-FILLED RECHARGE TRENCHES. VOLUME I OF THIS IMPLEMENTATION DOCUMENT CONTAINS: 1. MOU BETWEEN THE ARMY AND SHELL CONCERNING SHELL'S PARTICIPATION IN THE IRA'S 2. CONSTRUCTION WORK PLANS 3. COST ESTIMATES 4. TASK SPECIFIC HEALTH AND SAFETY PLAN. VOLUME II CONTAINS ENGINEERING SPECIFICATIONS. ENGINEERING DRAWINGS ARE FOUND IN VOLUME III.				
14. SUBJECT TERMS IRA E, COST, SCHEDULE, HEALTH, SAFETY, SPECIFICATION			15. NUMBER OF PAGES	
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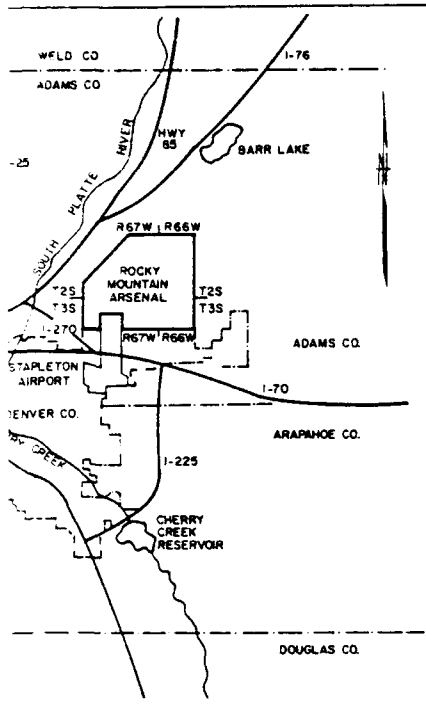
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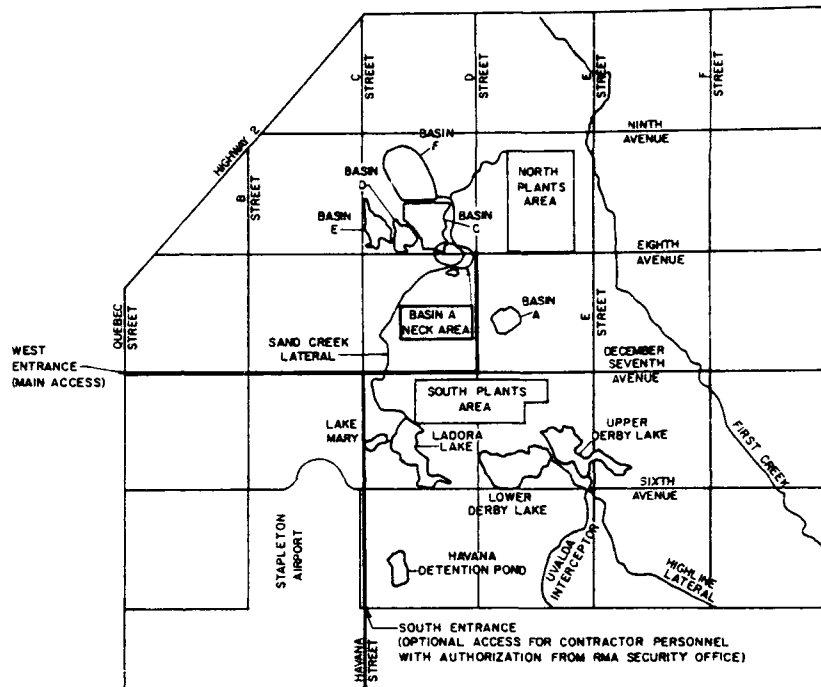
BASIN A NECK IRA

OCKY MOUNTAIN ARSENAL - ADAMS COUNTY, COLORADO

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LOCATION MAP



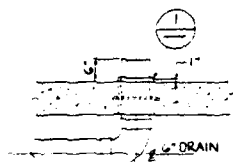
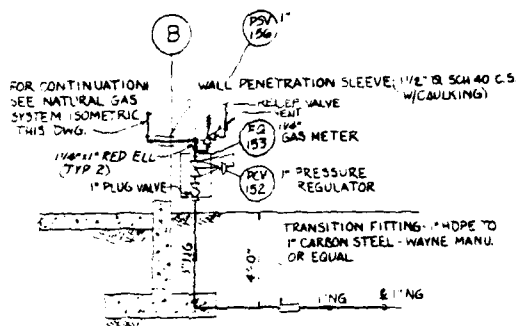
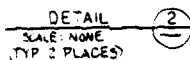
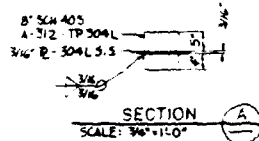
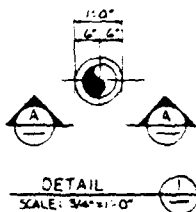
CONTRACTOR ACCESS

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DEPT. HBR PROJECT		CLIENT APPROVALS REV. BY DATE		DRAWING TITLE BASIN A NECK IRA COVER SHEET AND CONTRACTOR ACCESS		DRAWING NO. 373-34-001		REFERENCE NO. C-001		REV. 0	

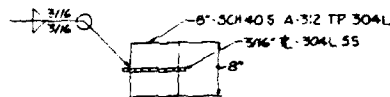
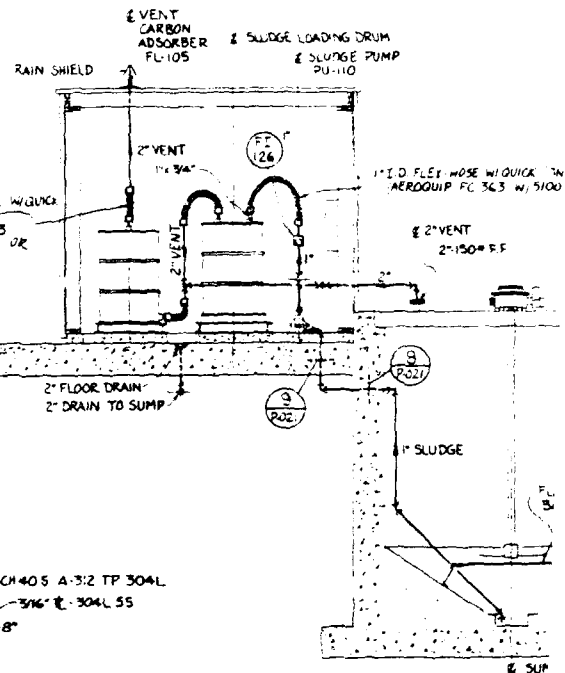
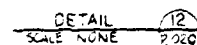
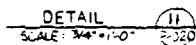
6. GENERAL NOTES:

1. FOOTING DESIGN IS BASED ON A SOIL BEARING CAPACITY OF ALL EXCAVATION, BACKFILL AND COMPACTION SHALL BE PERFORMED IN ACCORDANCE WITH SPECIFICATION 34-02.2 SITE PREPARATION EXCAVATION AND BACKFILLING.
2. EXCAVATIONS FOR FOOTINGS SHALL BE INSPECTED BY THE SOIL ENGINEER PRIOR TO PLACING CONCRETE.
3. DESIGN, PERFORMANCE AND REMOVAL OF CONSTRUCTION FORMWORK IS THE RESPONSIBILITY OF THE CONTRACTOR.
4. TOPOGRAPHICAL DATA IS MEAN SEA LEVEL AND BASED ON AERIAL PHOTOGRAMMETRY DATED 11-13-88 BY DELTA AERIAL - GEONEX, DENVER, COLORADO. COORDINATES ARE BASED ON COLORADO STATE PLANE, NORTH ZONE.
5. ALL EQUIPMENT FOUNDATIONS, ANCHOR BOLTS AND DIMENSIONS MUST BE CONFIRMED WITH CERTIFIED VENDOR DATA.
6. THE TREATMENT SYSTEMS, DEWATERING WELLS, ALLUVIAL MONITORING WELLS #11 - #18, DENVER FORMATION MONITORING WELLS, REPAIR SYSTEM, AND NECESSARY CONNECTING PIPING MUST BE OPERATIONAL AT THE BEGINNING OF THE SOIL-BENTONITE SLURRY WALL CONSTRUCTION. THE SOIL-BENTONITE SLURRY WALL WILL DAMPENING OF THE GROUNDWATER FLOW THROUGH THE BASIN AND AQUIFER, NECESSITATING SYSTEM START-UP.
7. ON SITE BORROW SHALL BE OBTAINED ONLY FROM SITES APPROVED BY THE ENGINEER.
8. CONSTRUCTION UTILITIES OBTAINED FROM ON SITE SHALL BE APPROVED BY THE ENGINEER.

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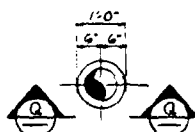


DRAIN HUB SLEEVE

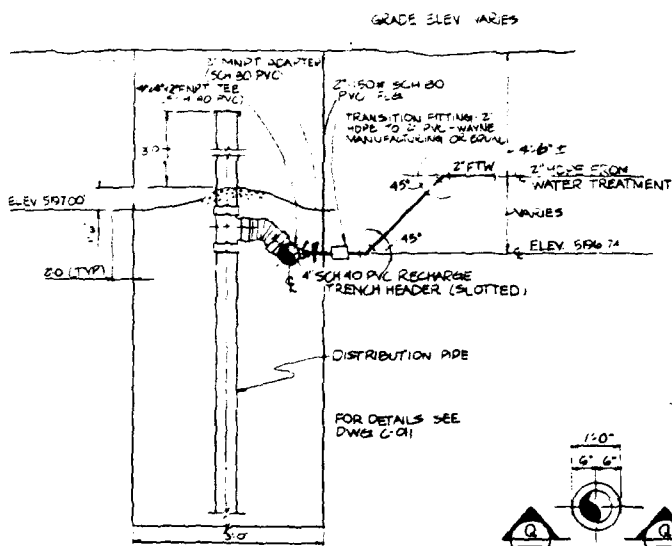


SECTION Q
SCALE: NONE

SECTION E
SCALE: 1/2" = 1'-0"



DETAIL 13
SCALE: NONE 0-020
(TYPICAL 3 PLACES)

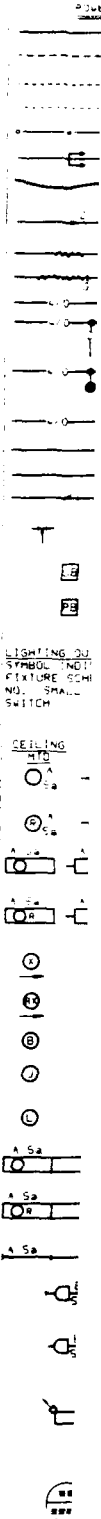
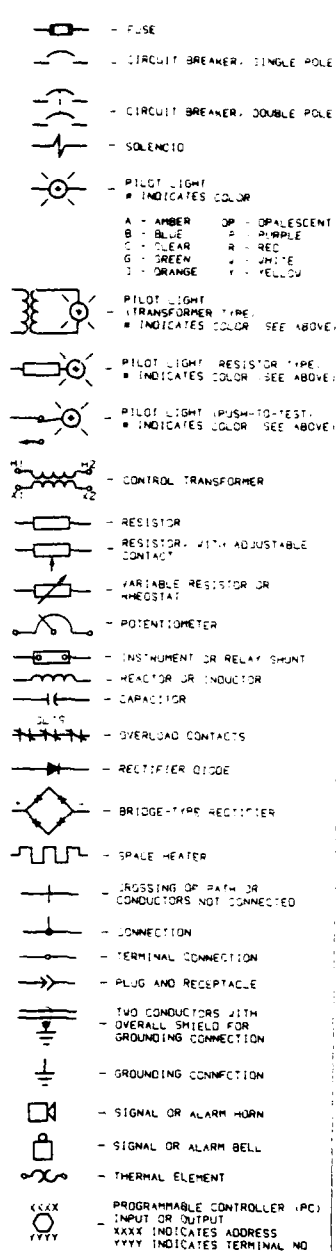


(TYPICAL 3 PLACES)

DETAIL 3
SCALE NONE P. 010

REFERENCE: PAGE C-011 RECHARGE SLURRY TRENCH SECTIONS P-021 PIPING & PLUMBING SECT. & DETAILS P-020 PIPING & PLUMBING PLANS P-010 WELL TRENCH UTILITY PIPING C-003 SITE PLAN P-020 RLD	REVISIONS NO. BY DATE CHKD DESCRIPTION	REVISIONS NO. BY DATE CHKD DESCRIPTION	DEPT. REV. A 0 ARCH. 88 JWA CIV. STR. 88 JWA MECH. 88 JWA ELEC. 88 JWA INSTR. 88 JWA PIPING 88 JWA SAFETY 88 JWA
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WORK ORDER 2127	30 X 42
DRAWING NO. 373-35-001	
REFERENCE NO. P-001	REV ○

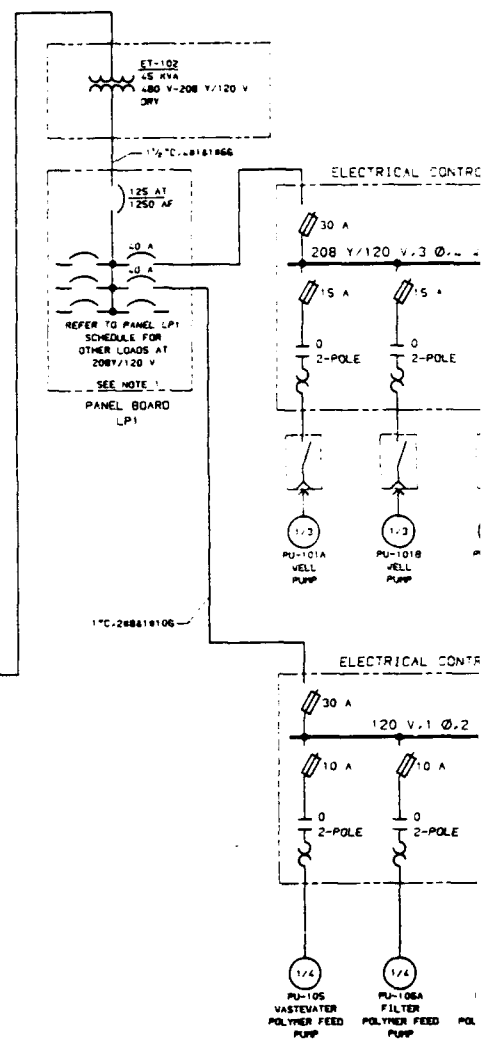
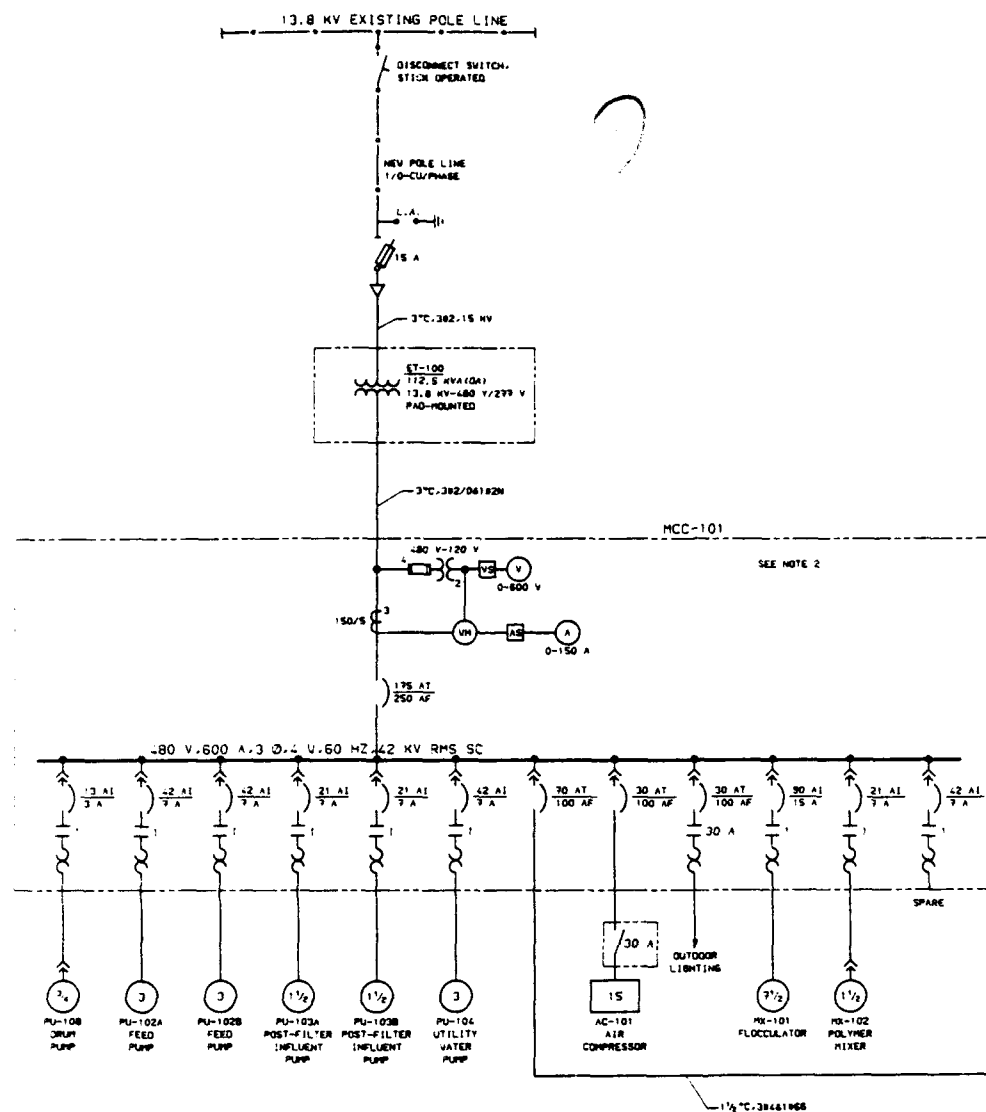
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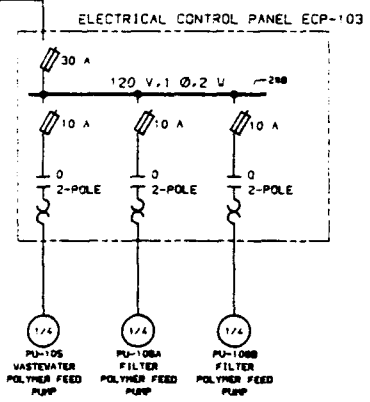
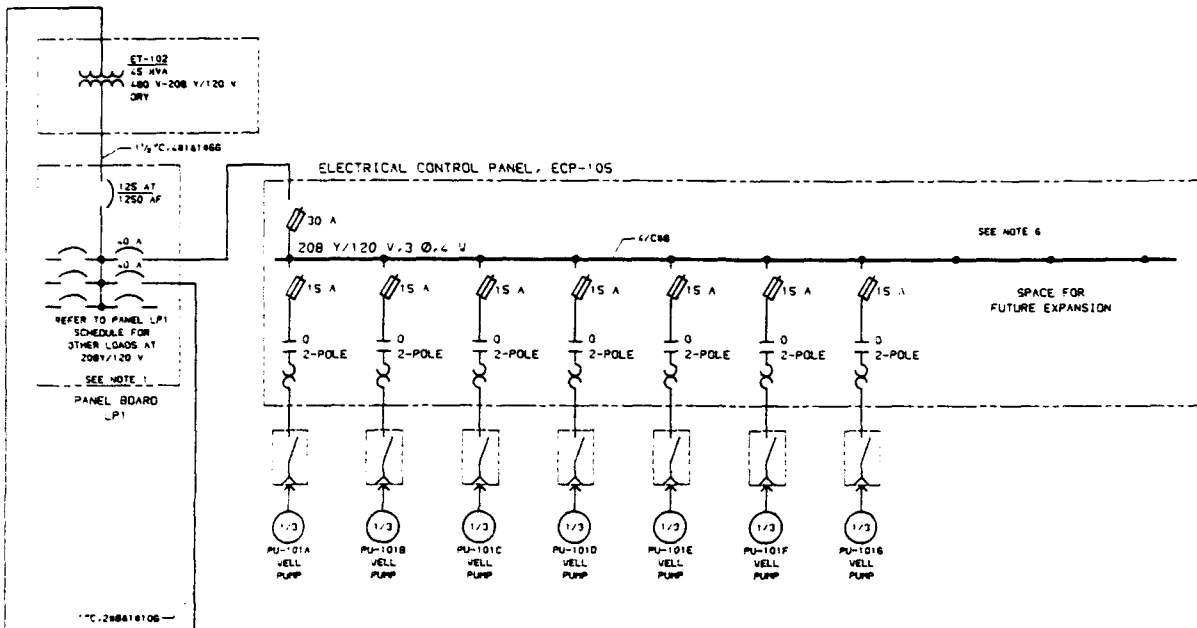
POWER & LIGHTING PLAN SYMBOLS

ABBREVIATIONS:

RGS - RIGID GALVANIZED STEEL
TSP - TWISTED SHIELDED PAIR
ECP - ELECTRICAL CONTROL PANEL
ICP - INSTRUMENT CONTROL PANEL
BCV - BARE COPPER WIRE

DEPT. REV. A B C D		SCALE NONE		DATE		 MORRISON-KNUDSEN ENGINEERS, INC. A CORP. OF THE STATE OF CALIFORNIA		SHELL OIL COMPANY		WORK ORDER NO.		30	
ARCH. <input checked="" type="checkbox"/>		DRAWN BY JJC		04/20/89				ROCKY MOUNTAIN ARSENAL REMEDIATION PROJECT		2127		42	
CIV./STN. <input checked="" type="checkbox"/>		DESIGNED BY JJC		04/20/89				INTERIM RESPONSE ACTION FINAL DETAILED DESIGN		DRAWING NO.		373-37-001	
MECH. <input checked="" type="checkbox"/>		CHECKED BY GMB		5/11/89				DRAWING TITLE		REFERENCE NO.		REV	
ELECT. <input checked="" type="checkbox"/>		CL. AT APPROVALS		REV BY DATE		BASIN A NECK IRA		E-001		0			
INSTR. <input checked="" type="checkbox"/>													
PIPING <input checked="" type="checkbox"/>													
SAFETY <input checked="" type="checkbox"/>													
DEPT. MGR. PROJECT		JJC 04/20/89											
APPROVALS													
GMB PROJECT MGR. 04/20/89													
APPROVAL ELABORATION PLAN, TL# 266													
BY AL L. ROSS													
& CORP. ENG. 04/20/89													
RATION													

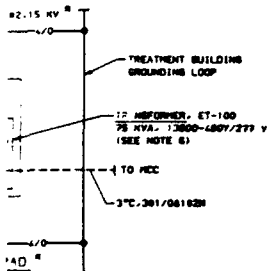
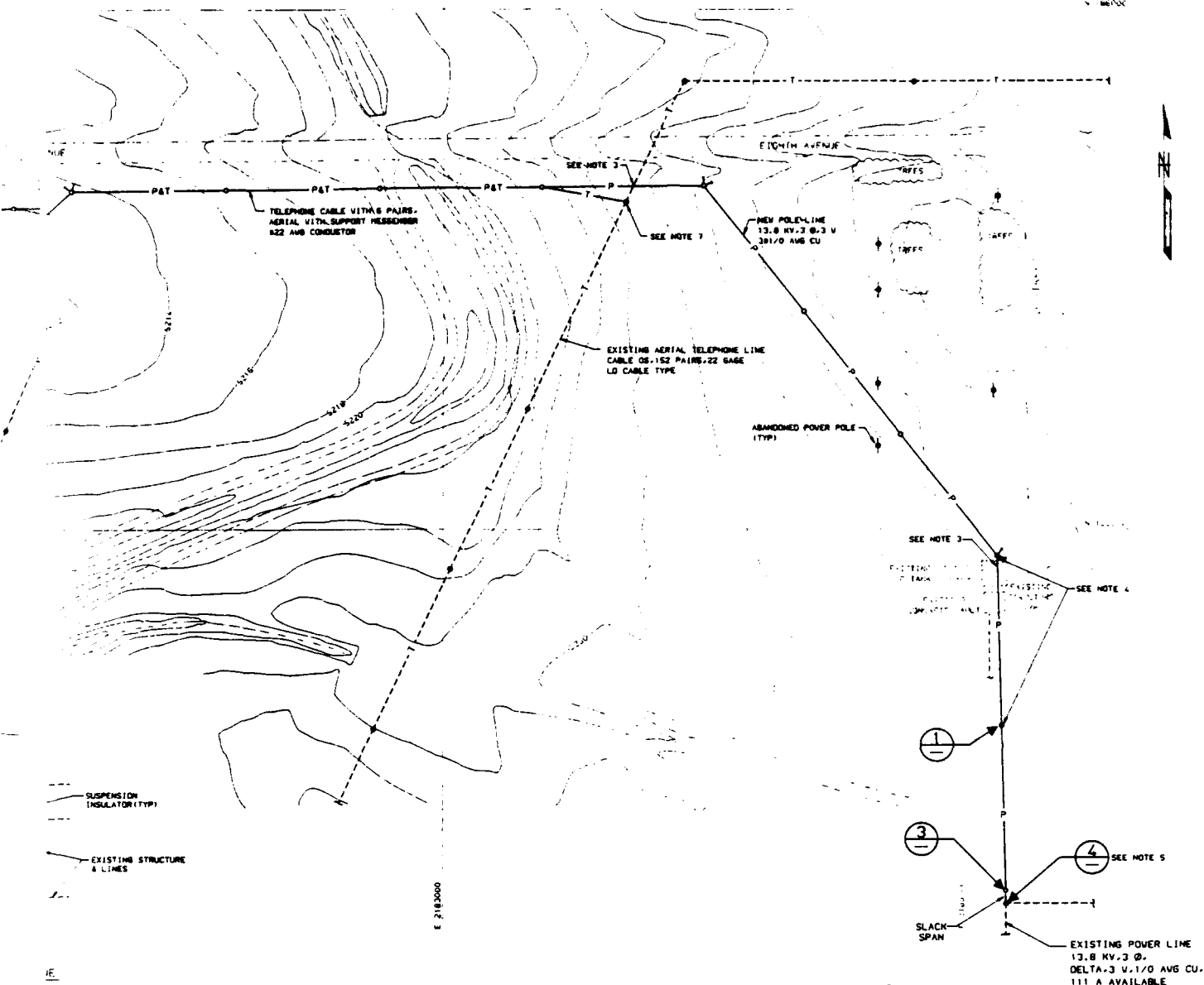
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- NOTES:**
- FOR COMPLETE PANEL SCHEDULE, REFER TO ELECTRICAL SPECIFICATION 37-1801, APPENDIX B.
 - FOR COMPLETE MCC DETAILS AND MCC UNIT WIRING DIAGRAM, REFER TO ELECTRICAL SPECIFICATION 37-1804.
 - ADJUSTABLE INSTANTANEOUS MAGNETIC TRIP ONLY CIRCUIT BREAKER (MCCB):
AT - DENOTES ADJUSTABLE INSTANTANEOUS TRIP SETTING
A - DENOTES CONTINUOUS RATING
 - THERMAL-MAGNETIC CIRCUIT BREAKER
AT - DENOTES THERMAL TRIP SETTING V/FIXED (OR ADJUSTABLE)
MAGNETIC TRIP
AF - DENOTES FRAME SIZE
 - CONTRACTOR SHALL CONFIRM ELECTRICAL DESIGN BASED ON ACTUAL PURCHASED EQUIPMENT PRIOR TO CONSTRUCTION.
 - FOR STARTER WIRING DIAGRAM REFER TO DRAWING E-021.

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MOYSSON-KNUDSEN ENGINEERS, INC.
A CORPORATION OF THE STATE OF CALIFORNIA



LEGEND:

- P--- EXISTING 12.8 KV POLE LINE
- P--- NEW 12.8 KV POLE LINE
- T--- EXISTING TELEPHONE LINE
- T--- NEW TELEPHONE LINE
- X--- EXISTING WOOD POLES
- X--- NEW WOOD POLES

NOTES:

1. CONTRACTOR TO PROVIDE THE FINAL LOCATION AND NUMBERS OF POLES AND GUYS.
2. CONTRACTOR TO PROVIDE LINE DESIGN AS REQUIRED BY SPECIFICATION 37-1677.
3. CONTRACTOR TO PROVIDE ADEQUATE CLEARANCES BETWEEN CONDUCTOR AND EXISTING STRUCTURE AND BETWEEN CONDUCTOR AND EXISTING TELEPHONE LINE IN ACCORDANCE WITH NATIONAL ELECTRICAL SAFETY CODE (NECS) REQUIREMENTS.
4. CONTRACTOR TO REPLACE EXISTING POLES UNLESS THE POLE CONDITION AND CHARACTERISTICS MEET THE DESIGN REQUIREMENTS.
5. CONTRACTOR SHALL MAKE NECESSARY MODIFICATION TO EXISTING CORNER POLE FOR CONNECTION OF THE NEW 12.8 KV LINE AND IS RESPONSIBLE FOR SPLICING OF THE NEW POWER LINE CONNECTION.
6. CONTRACTOR TO OBTAIN TRANSFORMER PAD REQUIREMENTS AND STUB-UP DETAILS FROM TRANSFORMER MANUFACTURER AND INSTALL IN ACCORDANCE WITH MANUFACTURER INSTRUCTIONS. REFER TO DRAWING 373-34-022 FOR PAD DETAILS.
7. CONTRACTOR SHALL CONSULT WITH THE OWNER AND/OR THE TELEPHONE UTILITY COMPANY, BEFORE PURCHASING EQUIPMENT AND MATERIALS TO DO THE SPLICING FOR TAPPING THE EXISTING TELEPHONE CABLE. THE FINAL INSTALLATION HAS TO BE INSPECTED AND APPROVED BY THE OWNER OR TELEPHONE UTILITY COMPANY.

		DEPT	REV	A	B	C	D	E											SCALE	1"= 50'	DATE
50'		ARCH			CL	CL	CL	CL											DRAWN BY	JMC	01/20/08
JMC		CLY/STR			CL	CL	CL	CL											DESIGNED BY	JMC	01/20/08
JMC		MECH			JTP	JTP	JTP	JTP											CHECKED BY	GBS	01/24/08
JMC		ELECT	JMC	JMC	JMC	JMC	JMC	JMC											CLIENT APPROVALS		
TYPN FL-0467		INSTR			IED	IED	IED	IED											REV	BY	DATE
APPROVAL		PIPING			DS	DS	DS	DS													
FATION PLAN, L1, R646		SAFETY						CL													
CONSENT - FL622																					
FL622		DEPT	REV	REF	JEN	JEN	JEN	JEN													
		CL			CL	CL	CL	CL													

MOORESON-KNUDSEN ENGINEERS, INC.

SHELL OIL COMPANY		WORK ORDER	30
ROCKY MOUNTAIN ARSENAL REMEDIATION PROJECT		2127	42
INTERIM RESPONSE ACTION FINAL DETAILED DESIGN		DRAWING NO.	373-37-003
DRAWING TITLE		REFERENCE NO.	E-003
BASIN A NECK IRA		REV	0
AREA ELECTRICAL DISTRIBUTION		REV 21-00-37-003	

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INSTRUMENT IDENTIFICATION NOTES:

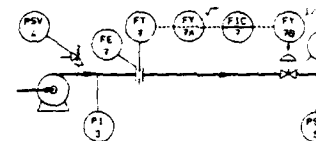
TAGGING AND LOOP IDENTIFICATION:

1. REFER TO ISA STANDARD 55.1 FOR LETTERS OR LETTER MEANINGS THAT DO NOT APPEAR IN TABLE ABOVE.
2. SHADED AREAS REPRESENT IMPROBABLE OR IMPOSSIBLE COMBINATIONS.
3. INSTRUMENT IDENTIFICATION IS MADE UP OF TWO TO FOUR LETTERS FROM THIS TABLE, FOLLOWED BY A LOOP NUMBER.
4. READILY RECOGNIZED SELF-DEFINING CHEMICAL SYMBOLS SUCH AS CO₂, O₂, ETC., USED IN CONJUNCTION WITH ANALYSIS INSTRUMENTS. THE SYMBOL WILL BE PLACED OUTSIDE THE INSTRUMENT BALLOON.
5. THE GRAMMATICAL FORM OF THE SUCCEEDING LETTER MEANING MAY BE MODIFIED AS REQUIRED. FOR EXAMPLE, I MAY BE USED FOR INDICATOR OR INDICATING.
6. THE LETTERS F (RATIO) & D (DIFFERENTIAL) MAY BE USED AS MODIFIERS WITH AN APPROPRIATE FIRST LETTER, TO BETTER DEFINE THE FUNCTIONAL ASPECTS OF THE SYSTEM. FOR EXAMPLE: FFIC = FLOW RATIO INDICATING CONTROLLER AND POSM = PRESSURE DIFFERENTIAL SWITCH HIGH.

A UNIQUE NUMBER SHALL BE ASSIGNED TO EACH CONTROL EACH INSTRUMENT IN THAT LOOP SHALL BE IDENTIFIED. ITEMS SUCH AS PRESSURE GAGES, THERMOMETERS, PRESSURE, ETC., OR ANY INSTRUMENT USED INDIVIDUALLY SHALL BE INDIVIDUAL CONTROL OR MONITOR LOOP.

EACH LOOP SHALL HAVE A UNIQUE NUMBER.

TYPICAL LOOP DIAGRAM



LINE IDENTIFICATION:

6*-POV

SIZE _____








SERVICE _____

PIPELINE SERVICE ABBREVIATIONS:

PA	PLANT AIR
IA	INSTRUMENT AIR
PW	POTABLE WATER
SS	SANITARY SEWER
NG	NATURAL GAS
RGV	RAW GROUND WATER
FGV	FILTERED GROUND WATER
ATV	ADSORBER TREATED WATER
UV	UTILITY WATER
FTV	FILTERED TREATED WATER
SPD	SUMP PUMP DISCHARGE
BWV	BACKWASH WASTEWATER
PS	POLYMER SUPPLY
V	VENT
DR	DRAIN

SYMBOLS USED IN CONJUNCTION WITH SIGNAL CONDITIONERS AND COMPUTING DEVICES TO DESCRIBE THE FUNC

CURRENT TO PNEUMATIC PNEUMATIC TO CURRENT CURRENT TO HYDRAULIC VOLTAGE TO PNEUMATIC PNEUMATIC TO

I/P	P/I	I/H	E/P	P/E
ADD & SUBTRACT	SUBTRACT	MULTIPLY	DIVIDE	SQUARE ROOT
				HIGH SELECT
				LOW SELECT
				
				
				

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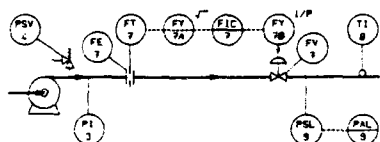
DOCUMENT IDENTIFICATION

INDICATOR	INDICATING CONTROLLER	INTEGRATOR	RECORDER	RECORDER CONTROLLER	SWITCH	SAFETY VALVE	TRANSMITTER	VALVE DAMPER-RELAY	MODIFIER OR CONDITIONER
IC	AC	RC	SC	SV	T	V	Y		
ALC	AR	ARC	AS	BSV	AT	AV	AY		
CLC	CR	CRC	CS		CT	CV	CY		
DIC	DR	DRC	DS		DT	DV	DY		
ELC	ER	ERC	ES		ET	EV	EY		
FIC	FR	FRC	FS		FT	FV	FY		
ILC	IR	IRC	IS		IT	IV	IY		
JLC	JR	JRC	JS		JT	JV	JY		
LIC	LR	LRC	LS		LT	LV	LY		
MIC	MR	MRC	MS		MT	MV	MY		
PIC	PR	PRC	PS	PSV	PT	PV	PY		
SLC	SR	SRC	SS		ST	SV	SY		
TRC	TR	TRC	TS		TT	TV	TY		
ULC	UR	URC	US		UT	UV	UY		
VL	VR	VRC	VS		VT	VV	VY		
WLC	WR	WRC	WS		WT	WV	WY		
YLC	YR	YRC	YS		YT	YV	YY		

TAGGING AND LOOP IDENTIFICATION:

A UNIQUE NUMBER SHALL BE ASSIGNED TO EACH CONTROL OR MONITOR LOOP AND EACH INSTRUMENT IN THAT LOOP SHALL BE IDENTIFIED BY THE SAME NUMBER. ITEMS SUCH AS PRESSURE GAGES, THERMOMETERS, PRESSURE SAFETY VALVES, ETC., OR ANY INSTRUMENT USED INDIVIDUALLY SHALL BE TREATED AS AN INDIVIDUAL CONTROL OR MONITOR LOOP. EACH LOOP SHALL HAVE A UNIQUE NUMBER.

TYPICAL LOOP DIAGRAM



CONDITIONERS AND COMPUTING DEVICES TO DESCRIBE THE FUNCTION	CURRENT TO HYDRAULIC	VOLTAGE TO PNEUMATIC	PNEUMATIC TO VOLTAGE
	I/H	E/P	P/E
	DIVIDE	SQUARE ROOT	HIGH SELECT
			LOW SELECT

SYMBOL DESCRIPTION

VALVE BODY	
	GATE
	GLOBE
	BUTTERFLY
	CHECK
	ROTARY BALL
	ROTARY PLUG
	PINCH
	DIAPHRAGM
	LOUWER OR DAMPER
	ANGLE - THREE WAY - FOUR WAY

ACTUATOR	
	FLOAT
	DIAPHRAGM / DIAPHRAGM PRESSURE-BALANCED
	ROTARY MOTOR
	DOUBLE ACTING CYLINDER
	HAND ACTUATOR
	PRESSURE RELIEF OR SAFETY VALVE / VACUUM RELIEF
	SOLENOID / ELECTRO-HYDRAULIC
	PRESSURE CONTROL VALVE SELF CONTAINED (SELF CONNECTED) / (DIRECT CONNECTED)
	BACK PRESSURE CONTROL VALVE SELF CONTAINED (SELF CONNECTED) / (DIRECT CONNECTED)

MISCELLANEOUS	
	GENERALIZED - FOR UNDEFINED OR COMPLEX INTERLOCK LOGIC
	INTERLOCK IS EFFECTIVE ONLY IF ALL INPUTS EXIST
	INTERLOCK IS EFFECTIVE IF ANY ONE OR MORE INPUTS EXIST
	TIME DELAY
	CHEMICAL SEAL
	PILOT LIGHT
	INPUT-OUTPUT POINTS TO COMPUTERS, PCs, ETC.

DRAWING NUMBERING SYSTEM:

03-38-0-001
DRAWING SEQUENTIAL NUMBER
RESPONSIBLE DISCIPLINE
PROJECT AREA

DISCIPLINE NUMBERS:

- 33 ARCHITECTURAL
- 34 CIVIL/STRUCTURAL
- 35 PIPING
- 36 MECHANICAL
- 37 ELECTRICAL
- 38 INSTRUMENTATION

SYMBOL DESCRIPTION

INSTRUMENT LINE	
	CONNECTION TO PROCESS, MECHANICAL LINK OR INSTRUMENT SUPPLY
	ELECTRICAL SIGNAL
	PNEUMATIC SIGNAL OR UNDEFINED SIGNAL
	CAPILLARY TUBING (FILLED SYSTEM)
	HYDRAULIC SIGNAL
	ELECTROMAGNETIC, SONIC OR RADIATION SIGNAL (WITHOUT WIRING OR TUBING)
	COMMON OR INTERCONNECTED SIGNAL
	INTERLOCKED SIGNALS

INSTRUMENT BALLOON	
	LOCALLY MOUNTED
	MOUNTED ON CONTROL PANEL
	MICROPROCESSOR OR COMPUTER BASED SYSTEM - SHARED DISPLAY
	MOUNTED BEHIND CONTROL PANEL
	MOUNTED BEHIND LOCAL PANEL
	LOCALLY MOUNTED TWO VARIABLES OR FUNCTIONS
	MOUNTED ON CONTROL PANEL TWO VARIABLES OR FUNCTIONS
	MOUNTED ON LOCAL PANEL TWO VARIABLES OR FUNCTIONS
	MOUNTED BEHIND CONTROL PANEL TWO VARIABLES OR FUNCTIONS
	MOUNTED BEHIND LOCAL PANEL TWO VARIABLES OR FUNCTIONS

PROCESS QUANTITY	
	LIQUID FLOW
	WEIGHT FLOW
	GAS FLOW
	PRESSURE
	TEMPERATURE

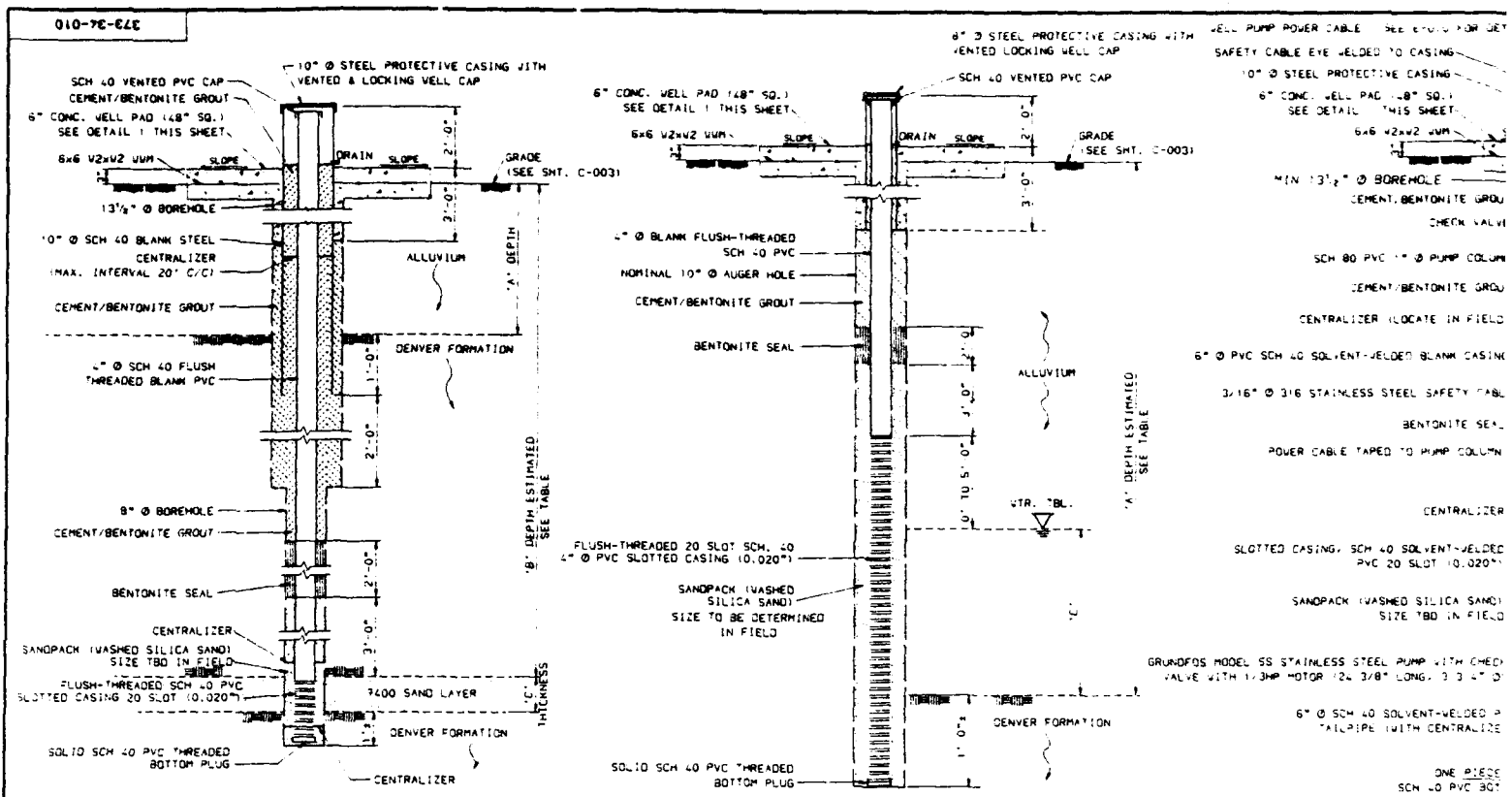
PRIMARY ELEMENT	
	VENTURI TUBE OR FLOW NOZZLE / ORIFICE PLATE
	WEIR / FLUME
	MAGNETIC FLOW METER / TURBINE METER
	TEMPERATURE ELEMENT WITH WELL
	FILLED SYSTEM TEMPERATURE INDICATOR WITH WELL
	BI-METALLIC, GLASS THERMOMETER OR OTHER LOCAL TEMPERATURE INDICATOR
	INLINE TYPE FLOW INDICATOR

DEPT	REV	A	B	C	D	SCALE	DATE
ARCH						NONE	2/13/88
CIV/STR							DESIGNED BY CED 2/13/88
MECH							CHECKED BY DLS 4/18/82
SELECT							CLIENT APPROVALS
INSTR							REV BY DATE
PIPING							
SAFETY							
DEPT MGR							
PROJECT							

MORRISON-KNUDSEN ENGINEERS, INC.
A PROFESSIONAL SERVICE COMPANY

SHELL OIL COMPANY
ROCKY MOUNTAIN ARSENAL REMEDIATION PROJECT
INTERIM RESPONSE ACTION FINAL DETAILED DESIGN
DRAWING TITLE: BASIN A NECK IRA GROUNDWATER TREATMENT SYSTEM PROCESS AND INSTRUMENTATION DIAGRAM SYMBOLS AND LEGEND

WORK ORDER NO.	2127	30
DRAWING NO.	373-38-001	42
REFERENCE NO.	I-001	0



RMA BASIN 'A' M

DENVER FORMATION MONITORING WELLS				▲
WELL	COORDINATES	APPROX. DEPTHS (FT.)		
		'A'	'B'	'C'
DMV-1	N 185.290 E2.182.390	20	47	24
DMV-2	N 185.210 E2.181.735	19	38	24

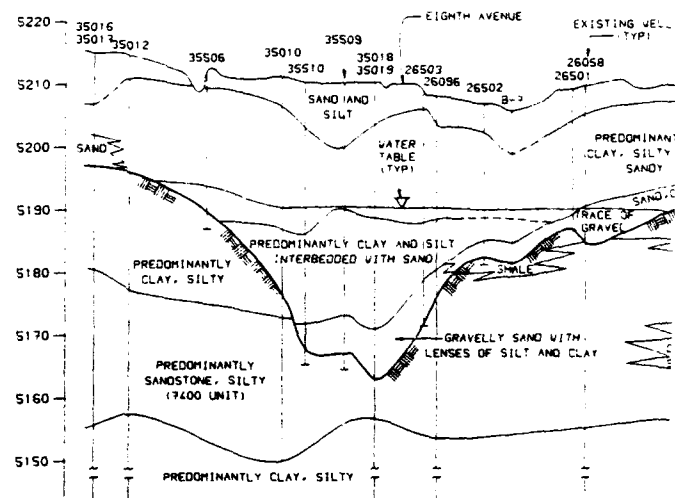
WELL	COORDINATES	APPROX. DEPTHS (FT.)	
		'A'	'C'
DW-1	N 195,628 E2,181,395	37	19
DW-2	N 195,722 E2,181,390	47	27
DW-3	N 195,819 E2,182,045	36	16
DW-4	N 195,628 E2,182,027	44	25
DW-5	N 195,723 E2,182,082	40	20
DW-6	N 195,819 E2,182,137	30	10
DW-7	N 195,396 E2,182,108	28	9

NOTE: ACTUAL DEPTHS WILL BE DETERMINED IN THE FIELD
DURING INSTALLATION DEPTHS COULD VARY BY 5' OR MORE

ALLUVIAL MONITORING VELLS @ PROPOSED

WELL	COORDINATES	APPROX. DEPTHS (FT.)	
		'A'	'C'
AMU-1	N 185.546 E2,181.775	21	5
AMU-2	N 185.525 E2,181.803	21	5
AMU-3	N 185.648 E2,181.838	30	14
AMU-4	N 185.627 E2,181.872	31	15
AMU-5	N 185.793 E2,181.927	47	26
AMU-6	N 185.772 E2,181.961	47	26
AMU-7	N 185.938 E2,182.016	30	10
AMU-8	N 185.917 E2,182.050	30	10
AMU-9	N 186.040 E2,182.078	24	4
AMU-10	N 186.019 E2,182.112	23	4
AMU-11	N 185.940 E2,181.886	25	7
AMU-12	N 185.900 E2,182.010	33	12
AMU-13	N 185.600 E2,181.975	37	20
AMU-14	N 185.580 E2,182.110	44	25
AMU-15	N 185.790 E2,182.090	34	14
AMU-16	N 185.760 E2,182.225	28	9
AMU-17	N 185.975 E2,182.200	24	6
AMU-18	N 185.940 E2,182.720	26	8

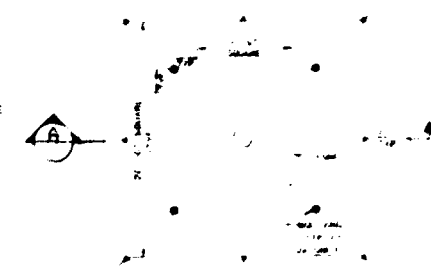
APV-1 THRU APV-10 TO BE CONSTRUCTED AFTER
TRENCH CONSTRUCTION IS COMPLETED.



GEOLOGIC SECTION
APPROXIMATELY 150' N.W. OF PROPOSED
WELLS DW-1, -2, -3 AND -7

100 50 0 100 200
HORIZONTAL SCALE IN FEET
10X VERTICAL EXAGGERATION

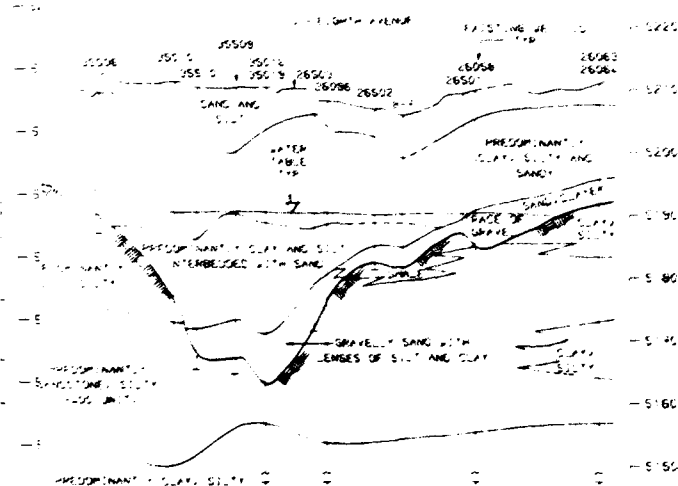
[illegible]



THE NATIONAL ARCHIVES
COLLECTION OF
RECORDS OF THE
UNITED STATES GOVERNMENT

SECTION 4

RMA BASIN 'A' NECK DE-ATERING WELL (CW-7)



5230 - SAND AND S
 5234 - SAND AND S

[illegible]

5 PE - SAME

5 PE - S. 1 AND 2.1
INTERFERED WITH
GRAPPEL - SAME

5-635-54- SANDS, JUNE

GEOLOGICAL
COLUMN
WELL 35507
VICINITY
PROPOSED
RECLAIM WELLS

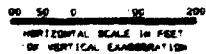
BASIN 'A' NECH HYDROSTRATIGRAPHIC JN.'S

ALL INFORMATION CONTAINED HEREIN IS UNCLASSIFIED
DATE 08-16-2011 BY 60322 UCBAW/SJS/KSP

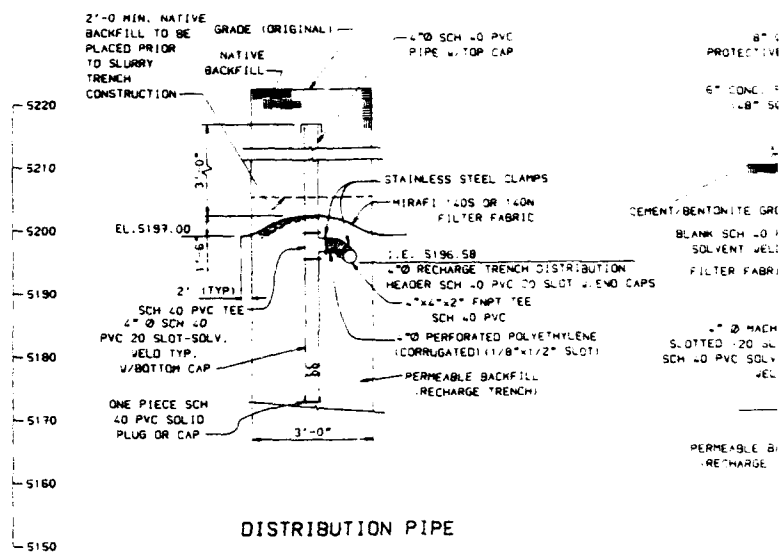
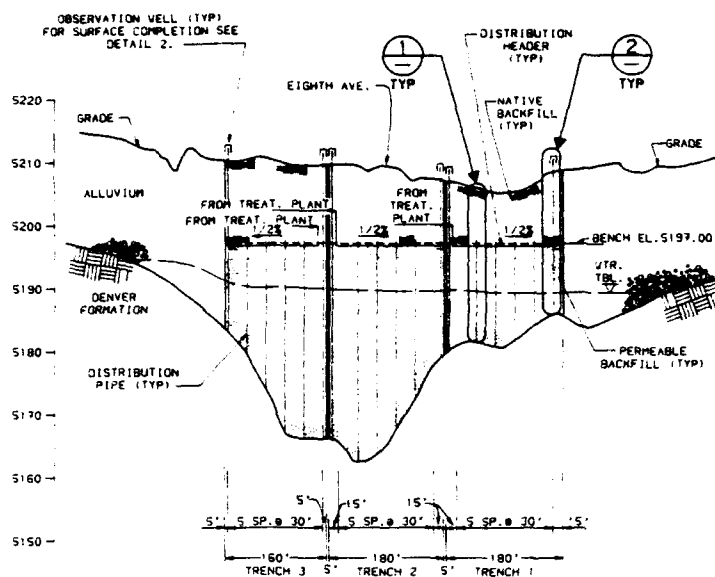
"SUNSHINE FARM" IN 1960-1961. THE HOUSE WAS BUILT IN 1960-1961
 BY THE FARMER, AND WAS BUILT ON A LOT OF 10 ACRES. THE
 HOUSE WAS BUILT ON A LOT OF 10 ACRES. THE HOUSE WAS BUILT
 ON A LOT OF 10 ACRES. THE HOUSE WAS BUILT ON A LOT OF 10 ACRES.

GEOLOGIC SECTION

APPROXIMATELY 150' N.W. OF PROPOSED
WELLS DW-1, -2, -3 AND -7

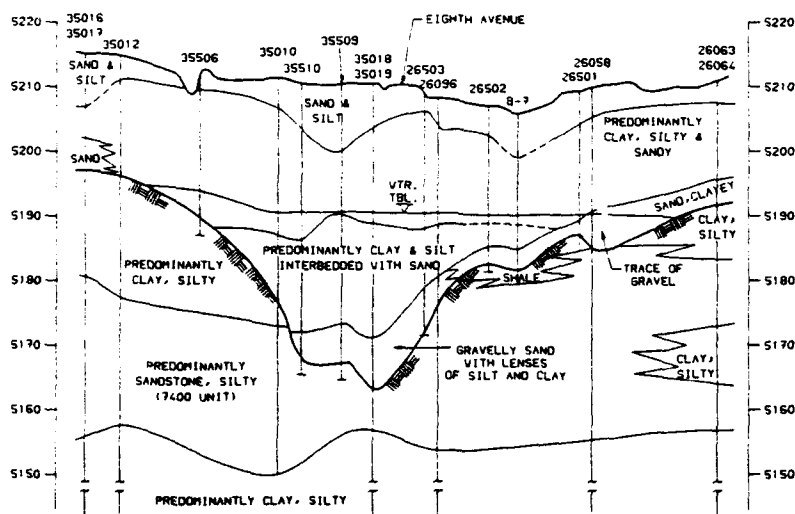


NAME NIELSEN UPPSALA		SHELL OIL COMPANY ROCKY MOUNTAIN ARSENAL REMEDIATION PROJECT OVERFLOW RESPONSE ACTION FINAL DETAILED DESIGN										WORK GROUP 2127		30 42	
PROJECT NO. 10012 DRAWING NO. 10012		BASIN A NECK IRA WELL CONSTRUCTION DATA										DRAWING NO. 373-34-010		REFERENCE NO. C-010	
DATE 10/1/88		DATE 10/1/88										REV 0		0	

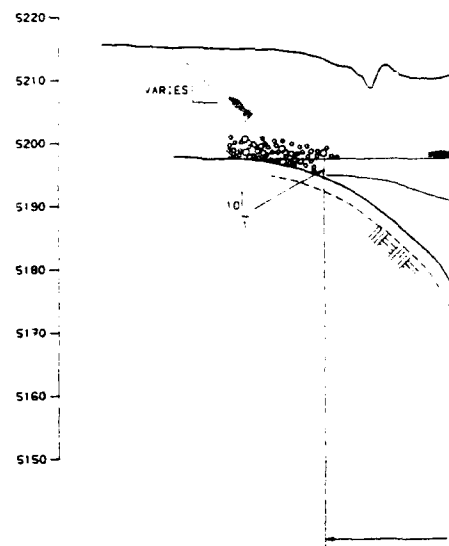


DETAIL (1)
N.T.S.

SCALE: HORIZ. 1" = 100'
VERT. 1" = 10'

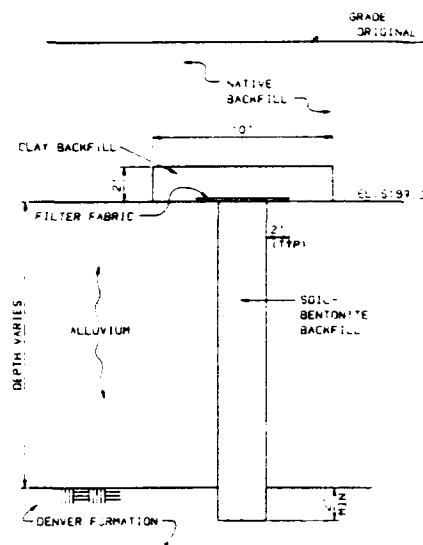


SCALE: HORIZONTAL 1" = 100'
VERTICAL 1" = 10'



RMA - BASIN 'A' NEC

[illegible]



DETAIL 3
N.T.S.



1. DISTRIBUTION PIPES AND OBSERVATION WELLS TO BE INSTALLED NEAR VERTICAL PER SPECIFICATION 34-0261

RMA - BASIN 'A' NECK SOIL - BENTONITE SLURRY CUTOFF TRENCH

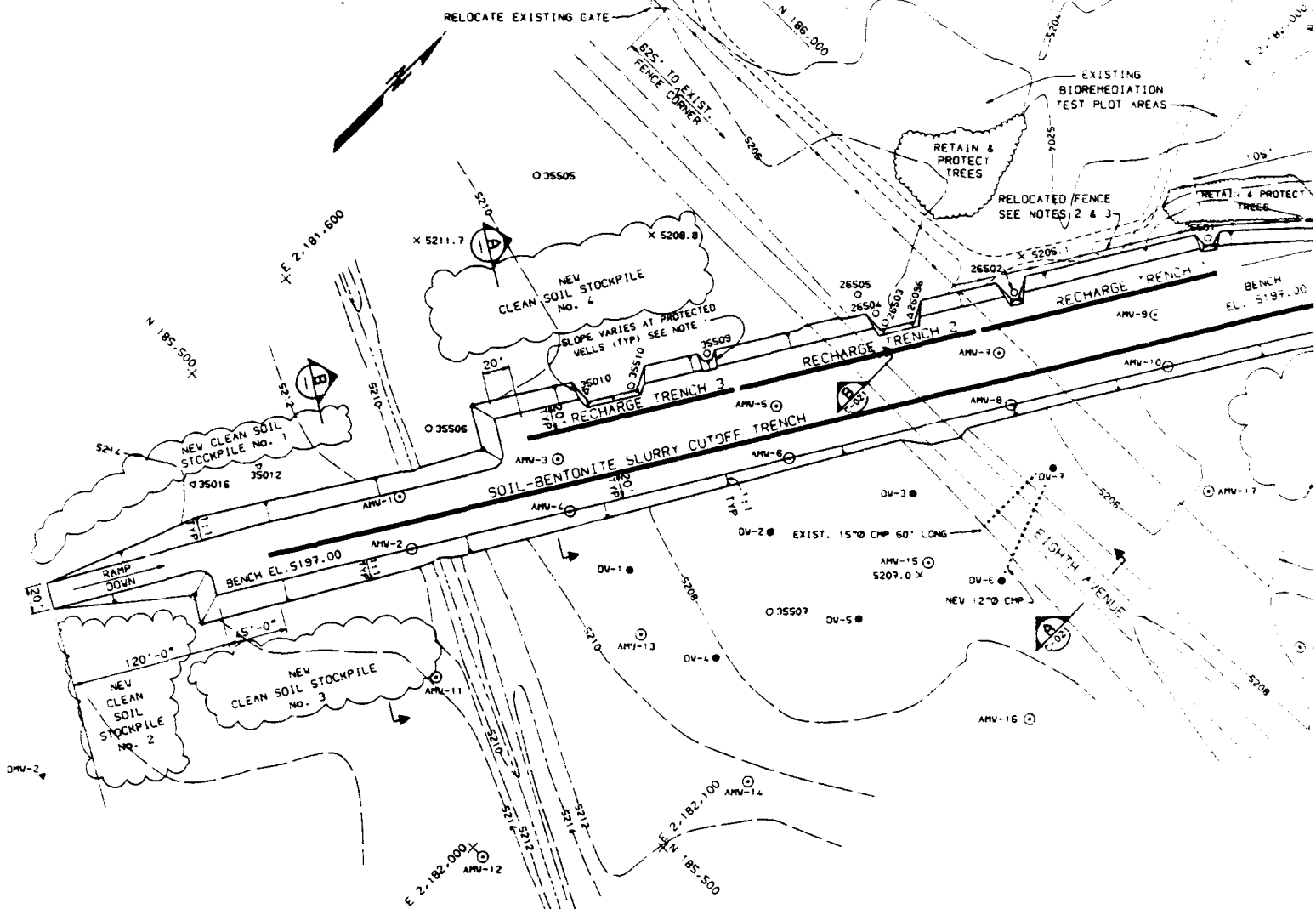
SCALE: HORIZONTAL 1" = 100'
VERTICAL 1" = 10'-0"

[illegible]

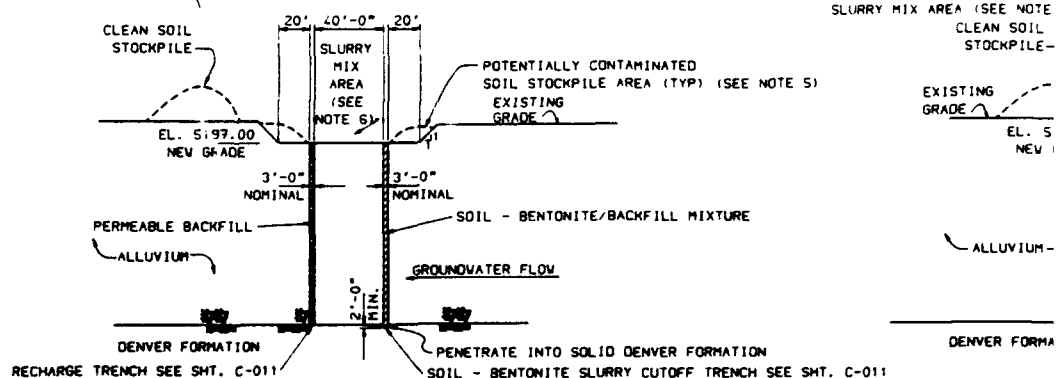
8/8/89

00-34-011

210-7E-67E

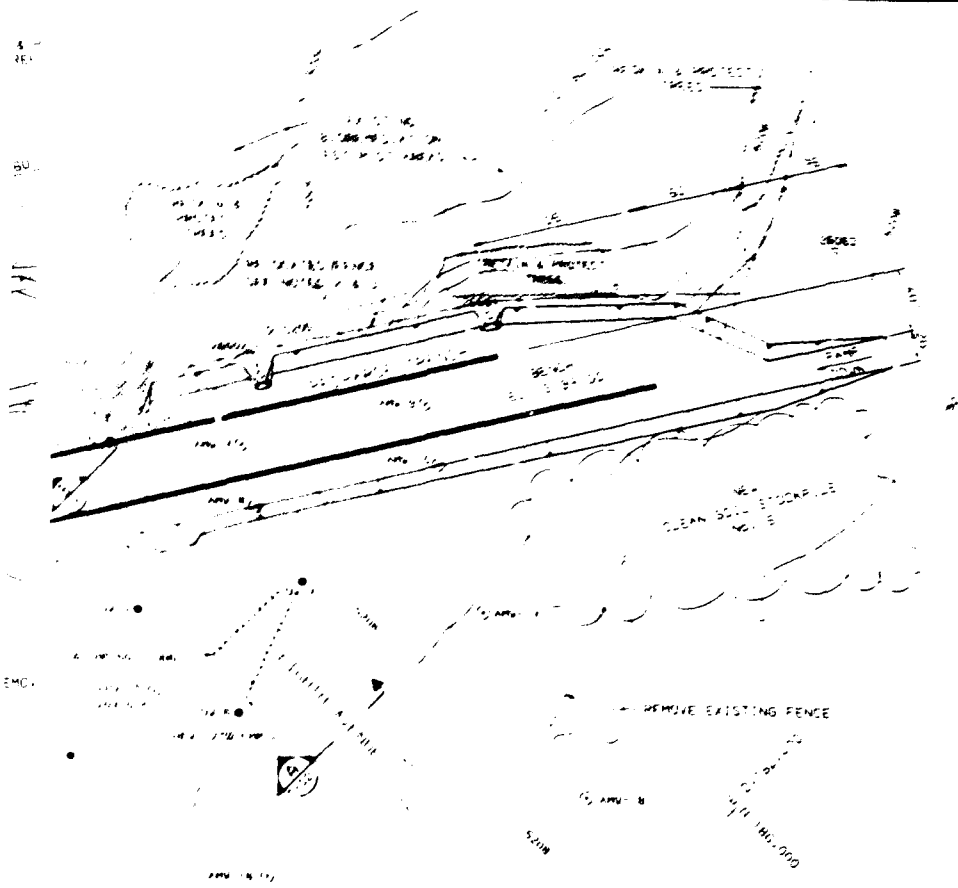


TRENCH WORKING BENCH GRADING PLAN
1" = 40'



SECTION A
1" = 40'

E-010 VELLO POWER & CONTROL LAYOUT & DET'S C-011 RECHARGE & SLURRY TRENCH SECTIONS C-010 VELL CONSTRUCTION DATA	NO. BY DATE CHD DESCRIPTION	NO. BY DATE CHD DESCRIPTION	DEPT. REV. A B C D CIVIL/STN. GB 5.8 5.8 5.8 5.8 SEC. JPK JPK JPK JPK INSTR. CED CED CED CED PIPING DLS DLS DLS DLS SAFETY JC JC JC JC	SCALE DRAWN BY DESIGNED BY CHECKED BY DATE
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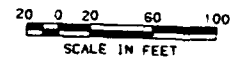
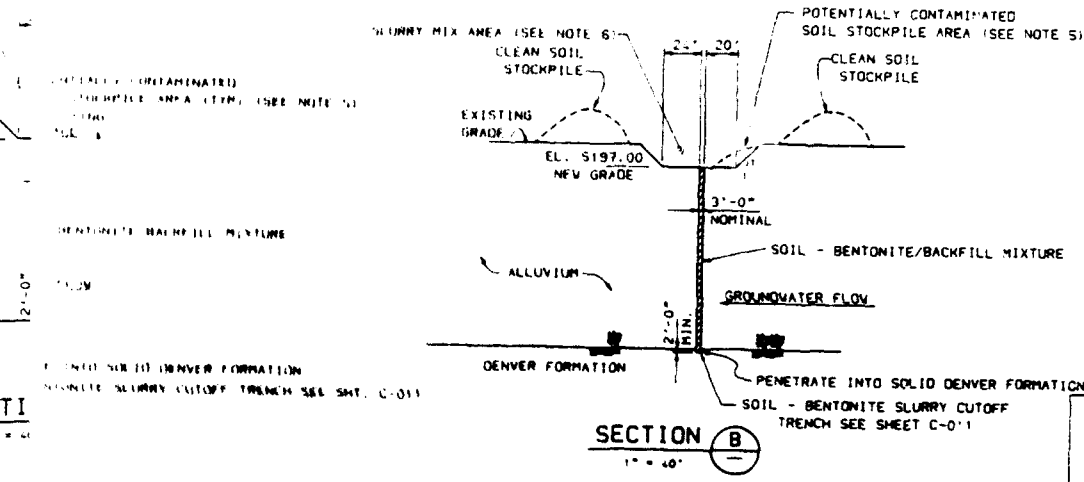
LEGEND

- 1. EXISTING ALLUVIAL FILL TO BE REMOVED AND STOCKPILED
- 2. EXISTING DENVER FORMATION TO BE REMOVED AND STOCKPILED
- 3. DENVER FORMATION TO BE STOCKPILED
- 4. EXISTING ALLUVIAL FILL TO BE STOCKPILED
- 5. EXISTING ALLUVIAL FILL TO BE STOCKPILED
- 6. DENVER FORMATION TO BE STOCKPILED

NOTES:

1. FIELD VERIFY AND INSURE SLOPE STABILITY AT PROTECTED WELLS
2. FIELD ENGINEER TO DETERMINE ALIGNMENT OF RELOCATED FENCE
3. MATCH EXISTING CONSTRUCTION FOR RELOCATED FENCE CONSTRUCTION - METAL POST, WOVEN WIRE AND 2 STRAND BARBED WIRE
4. TOPSOIL TO BE STOCKPILED SEPARATELY FROM OTHER EXCAVATED CLEAN SOIL PER SPECIFICATION 34-0010
5. SOIL EXCAVATED FROM TRENCHES SHALL BE CONSIDERED POTENTIALLY CONTAMINATED AND STOCKPILED. MAXIMUM HEIGHT SHALL BE LOWER THAN ADJACENT NATURAL GRADE
6. ALL SLURRY MIXING TO BE CONDUCTED WITH A WORKING BENCH AREA AND BELOW ADJACENT NATURAL GRADE
7. WORKING BENCH TO BE BACKFILLED. EIGHTH AVENUE RECONSTRUCTION. SOIL STOCKPILES REMOVED AND THE AREA REGRADED FOLLOWING COMPLETION OF RECHARGE TRENCHES AND CUTOFF WALLS IN ACCORDANCE WITH SPECIFICATIONS 34-0010, 34-0011 AND 34-0012
8. SEE SHEET C-010 FOR SURFACE COMPLETION AT WELLS

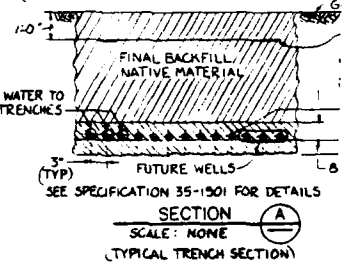
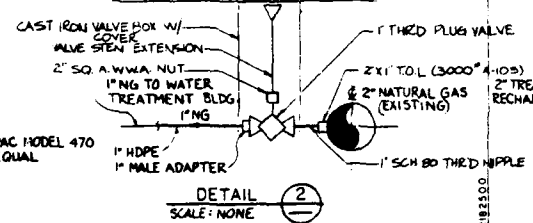
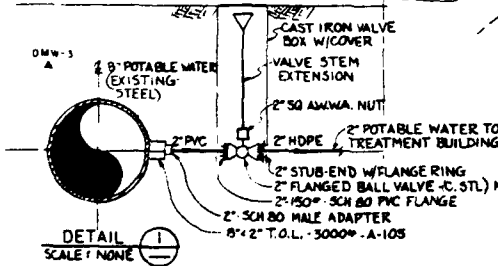
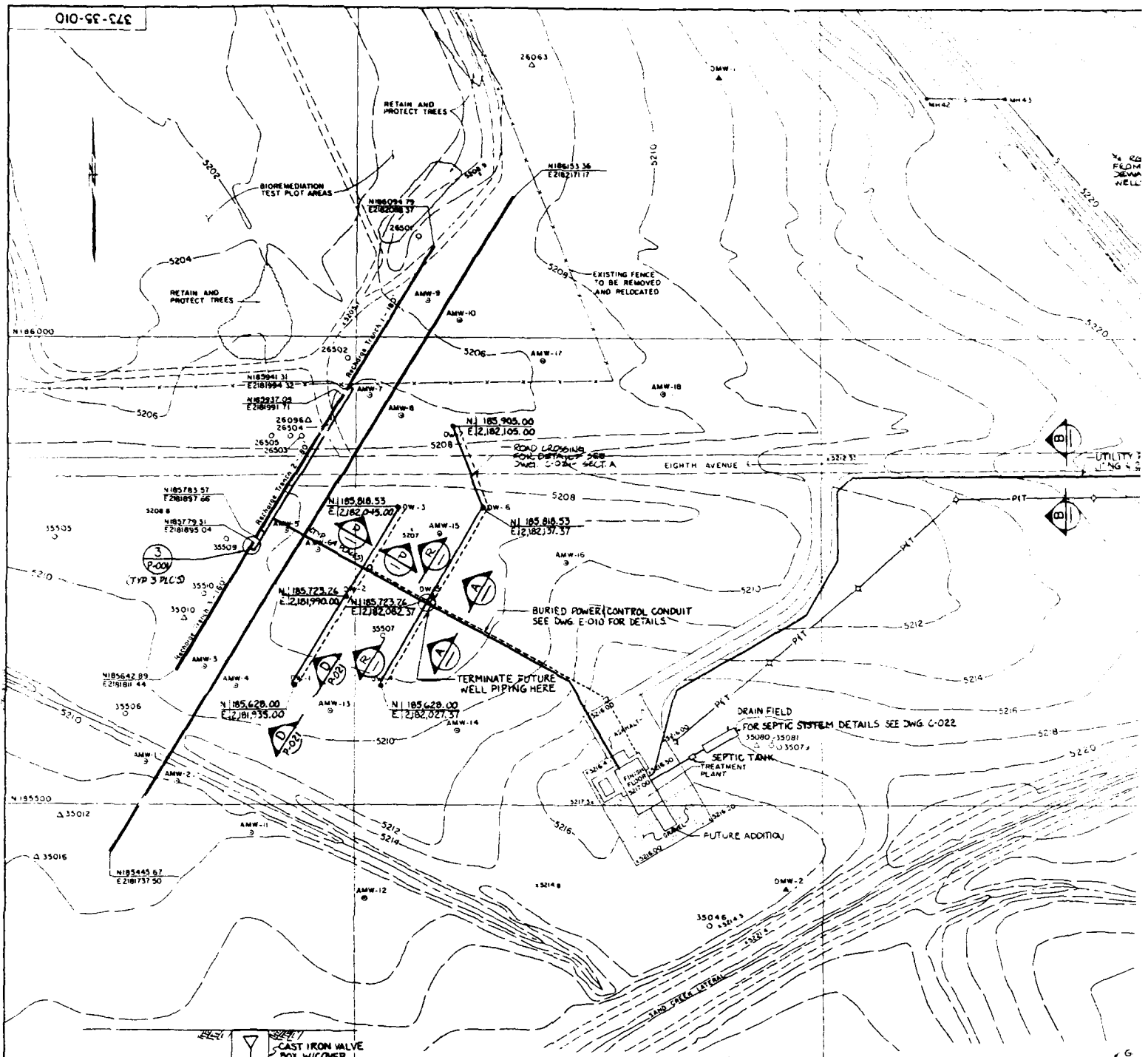
WORKING BENCH GRADING PLAN



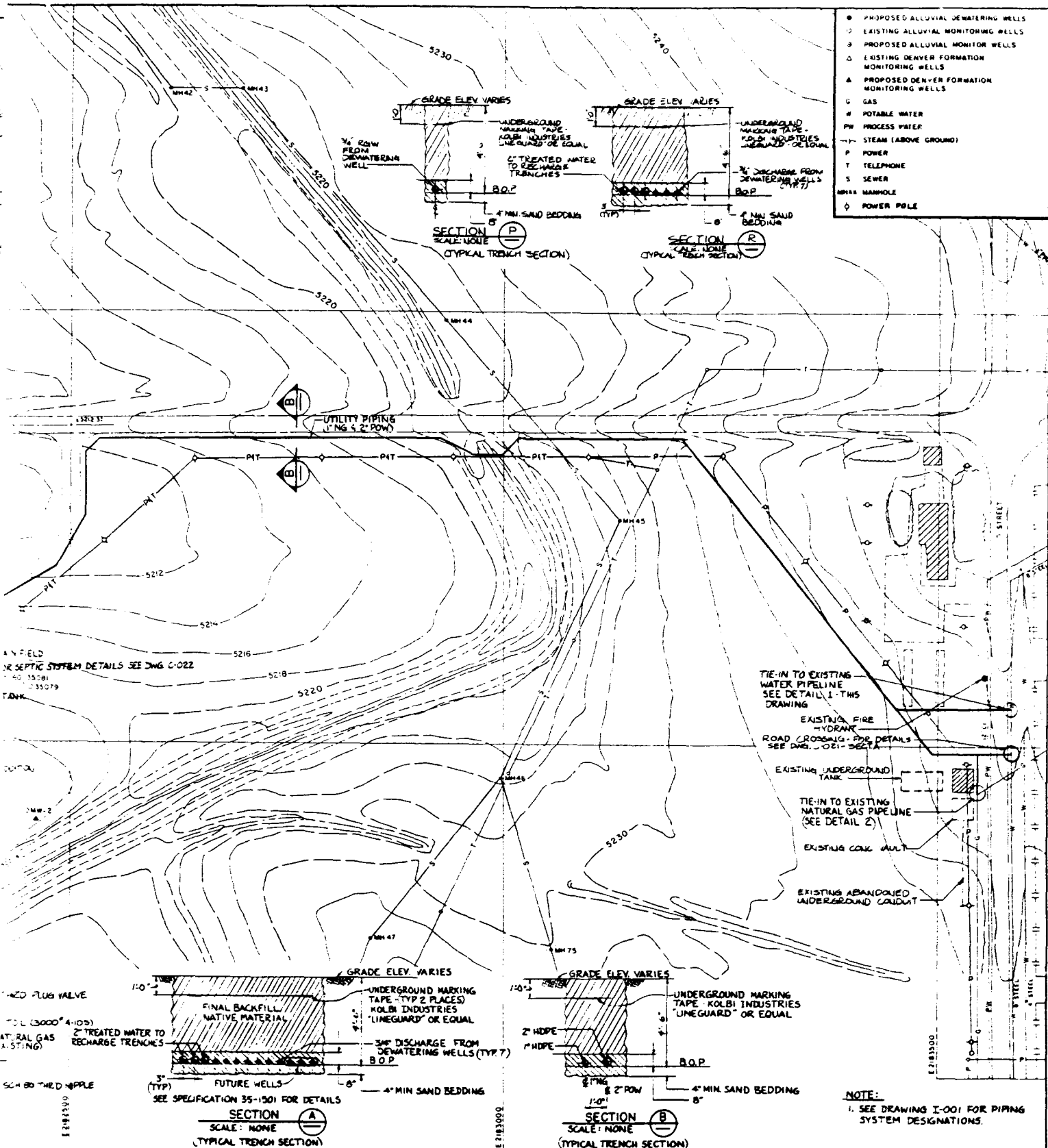
SECTION B
1" = 40'

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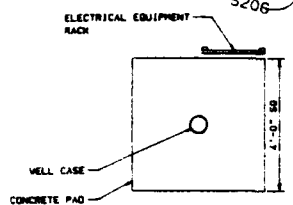
373-35-010



NO.	BY	DATE	CHKD	DESCRIPTION	NO.	BY	DATE	CHKD	DESCRIPTION	DEPT	REV	A	B	C	D	SCA
P-001				MISC. PIPING SECTIONS & DETAILS						ARCH						SCA
C-022				SEWAGE SYSTEM PLAN & DETAILS						CIV/STR						ORA
P-021				PIPING PLUMBING SECT. 1 DETAILS						MECH						DES
P-020				PIPING PLUMBING SECT. 2 DETAILS						ELECT						CHE
I-020				PIT						INST						REV
C-003				SITE PLAN						PIPING						
										SAFETY						
										DEPT. MGR						
										PROJECT						

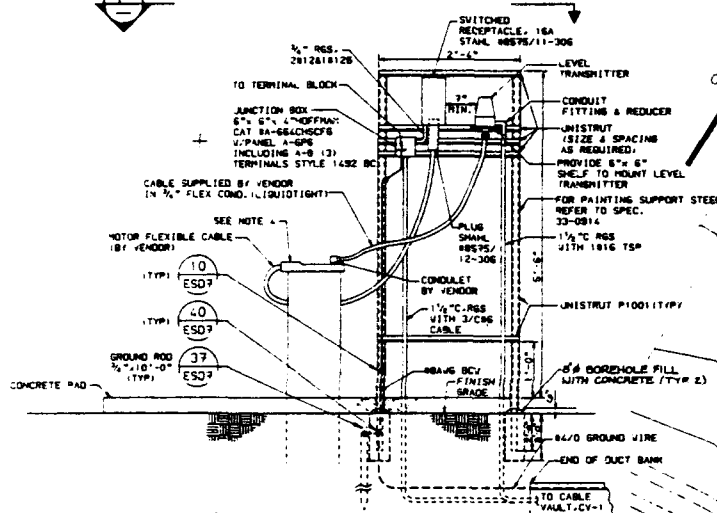


DEPT. REV. A ARCH. REV. A CIVIL/STR. REV. A ELEC. REV. A INSTR. REV. A PIPING REV. A SAFETY REV. A DEPT. NON REV. A PROJECT REV. A	SCALE: 1"=50' DRAWN BY: DLS DESIGNED BY: DLS CHECKED BY: SP CLIENT APPROVALS: REV. BY: DATE:	MORRISON-KNUDSEN ENGINEERS, INC. SHELL OIL COMPANY ROCKY MOUNTAIN ARSENAL REMEDIATION PROJECT INTERIM RESPONSE ACTION FINAL DETAILED DESIGN DRAWING TITLE: BASIN A NECK IRA WELL, TRENCH, UTILITY PIPING YAPD DISTRIBUTION	WORK ORDER: 2127 DRAWING NO.: 373-35-010 REFERENCE NO.: P-010	30 42
--	---	---	--	----------



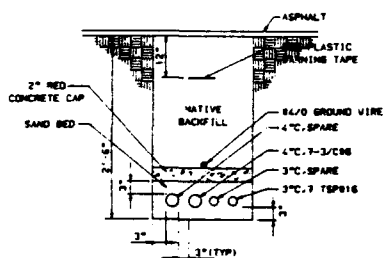
SECTION F

NTS

WELL ELECT EQUIP RACK PLAN
TYP FOR ALLWELL ELECT. EQUIPMENT ARRANGEMENT
(TYP FOR ALL)

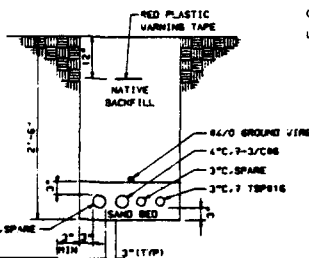
DETAIL 1

NTS



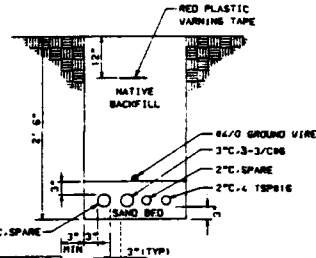
SECTION A

NTS



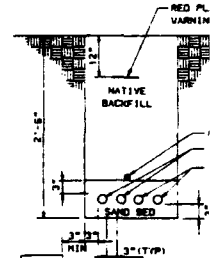
SECTION B

NTS



SECTION C

NTS

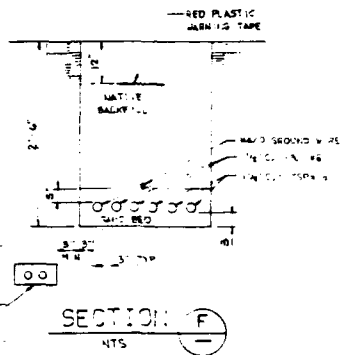
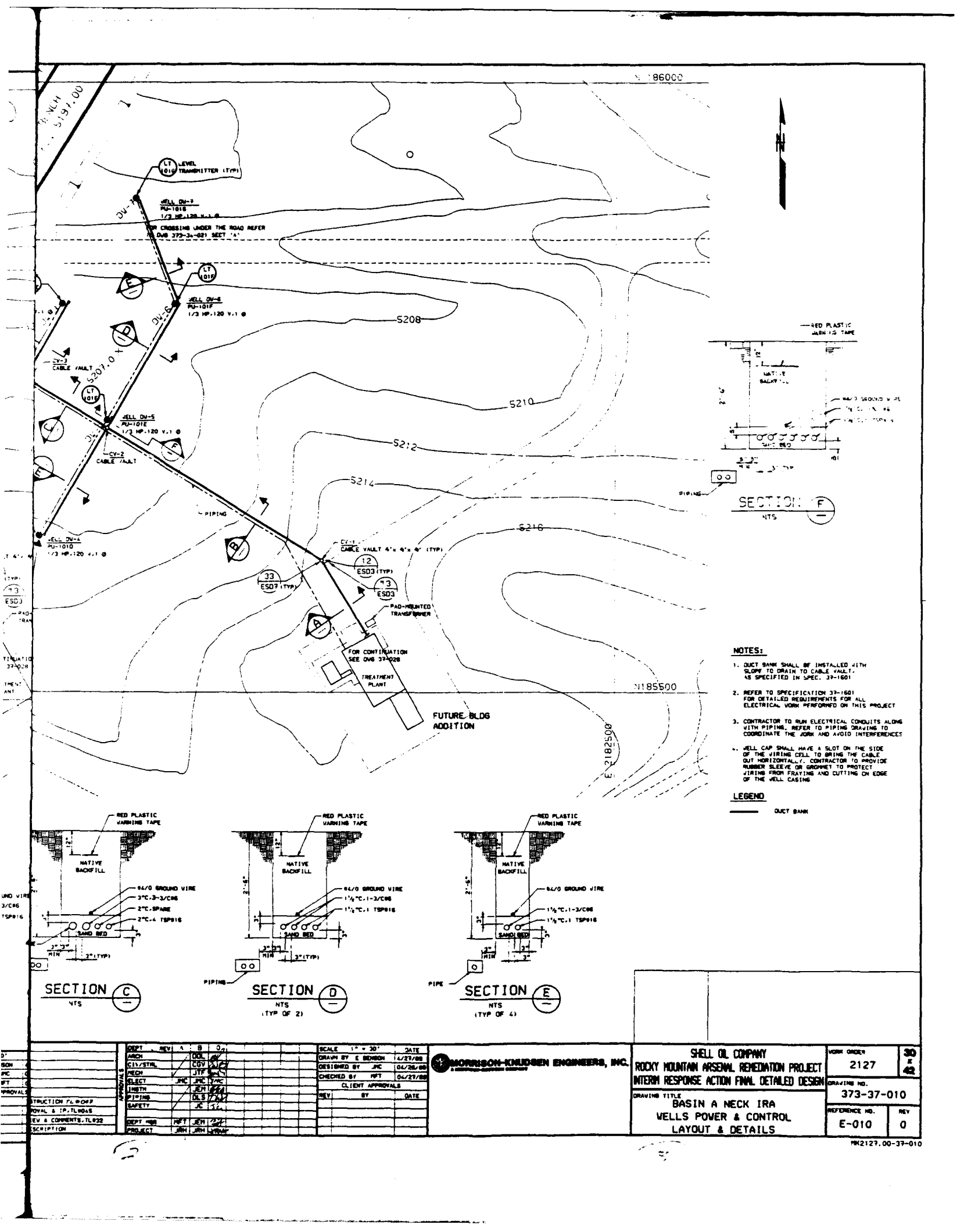


SECTION D

NTS

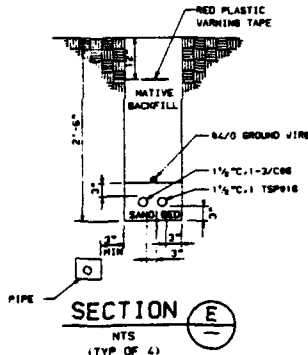
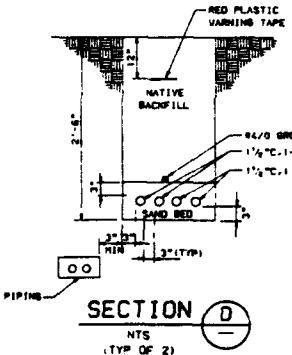
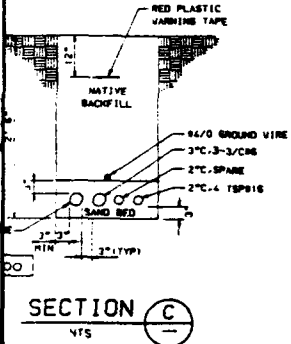
(TYP OF 2)

NO.	BY	DATE	CHD	DESCRIPTION	NO.	BY	DATE	CHD	DESCRIPTION	DEPT	REV	A	B	C	D	SCALE
0	JPC	06/26/89	JPC	ISSUED FOR CONSTRUCTION T.C. 0047	0	JPC	06/26/89	JPC	ISSUED FOR CONSTRUCTION T.C. 0047	DEPT	REV	A	B	C	D	SCALE
1	JPC	06/26/89	JPC	ISSUED FOR APPROVAL & J.P. T.L. 0045	1	JPC	06/26/89	JPC	ISSUED FOR APPROVAL & J.P. T.L. 0045	DEPT	REV	A	B	C	D	SCALE
2	JPC	06/26/89	JPC	ISSUED FOR REVIEW & COMMENTS T.L. 0022	2	JPC	06/26/89	JPC	ISSUED FOR REVIEW & COMMENTS T.L. 0022	DEPT	REV	A	B	C	D	SCALE
3	JPC	06/26/89	JPC	ISSUED FOR REVIEW & COMMENTS T.L. 0022	3	JPC	06/26/89	JPC	ISSUED FOR REVIEW & COMMENTS T.L. 0022	DEPT	REV	A	B	C	D	SCALE
4	JPC	06/26/89	JPC	ISSUED FOR REVIEW & COMMENTS T.L. 0022	4	JPC	06/26/89	JPC	ISSUED FOR REVIEW & COMMENTS T.L. 0022	DEPT	REV	A	B	C	D	SCALE
5	JPC	06/26/89	JPC	ISSUED FOR REVIEW & COMMENTS T.L. 0022	5	JPC	06/26/89	JPC	ISSUED FOR REVIEW & COMMENTS T.L. 0022	DEPT	REV	A	B	C	D	SCALE
6	JPC	06/26/89	JPC	ISSUED FOR REVIEW & COMMENTS T.L. 0022	6	JPC	06/26/89	JPC	ISSUED FOR REVIEW & COMMENTS T.L. 0022	DEPT	REV	A	B	C	D	SCALE
7	JPC	06/26/89	JPC	ISSUED FOR REVIEW & COMMENTS T.L. 0022	7	JPC	06/26/89	JPC	ISSUED FOR REVIEW & COMMENTS T.L. 0022	DEPT	REV	A	B	C	D	SCALE
8	JPC	06/26/89	JPC	ISSUED FOR REVIEW & COMMENTS T.L. 0022	8	JPC	06/26/89	JPC	ISSUED FOR REVIEW & COMMENTS T.L. 0022	DEPT	REV	A	B	C	D	SCALE
9	JPC	06/26/89	JPC	ISSUED FOR REVIEW & COMMENTS T.L. 0022	9	JPC	06/26/89	JPC	ISSUED FOR REVIEW & COMMENTS T.L. 0022	DEPT	REV	A	B	C	D	SCALE
10	JPC	06/26/89	JPC	ISSUED FOR REVIEW & COMMENTS T.L. 0022	10	JPC	06/26/89	JPC	ISSUED FOR REVIEW & COMMENTS T.L. 0022	DEPT	REV	A	B	C	D	SCALE
11	JPC	06/26/89	JPC	ISSUED FOR REVIEW & COMMENTS T.L. 0022	11	JPC	06/26/89	JPC	ISSUED FOR REVIEW & COMMENTS T.L. 0022	DEPT	REV	A	B	C	D	SCALE
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13	JPC	06/26/89	JPC	ISSUED FOR REVIEW & COMMENTS T.L. 0022	13	JPC	06/26/89	JPC	ISSUED FOR REVIEW & COMMENTS T.L. 0022	DEPT	REV	A	B	C	D	SCALE
14	JPC	06/26/89	JPC	ISSUED FOR REVIEW & COMMENTS T.L. 0022	14	JPC	06/26/89	JPC	ISSUED FOR REVIEW & COMMENTS T.L. 0022	DEPT	REV	A	B	C	D	SCALE
15	JPC	06/26/89	JPC	ISSUED FOR REVIEW & COMMENTS T.L. 0022	15	JPC	06/26/89	JPC	ISSUED FOR REVIEW & COMMENTS T.L. 0022	DEPT	REV	A	B	C	D	SCALE
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17	JPC	06/26/89	JPC	ISSUED FOR REVIEW & COMMENTS T.L. 0022	17	JPC	06/26/89	JPC	ISSUED FOR REVIEW & COMMENTS T.L. 0022	DEPT	REV	A	B	C	D	SCALE
18	JPC	06/26/89	JPC	ISSUED FOR REVIEW & COMMENTS T.L. 0022	18	JPC	06/26/89	JPC	ISSUED FOR REVIEW & COMMENTS T.L. 0022	DEPT	REV	A	B	C	D	SCALE
19	JPC	06/26/89	JPC	ISSUED FOR REVIEW & COMMENTS T.L. 0022	19	JPC	06/26/89	JPC	ISSUED FOR REVIEW & COMMENTS T.L. 0022	DEPT	REV	A	B	C	D	SCALE
20	JPC	06/26/89	JPC	ISSUED FOR REVIEW & COMMENTS T.L. 0022	20	JPC	06/26/89	JPC	ISSUED FOR REVIEW & COMMENTS T.L. 0022	DEPT	REV	A	B	C	D	SCALE



- NOTES:**
- 1. DUCT BANK SHALL BE INSTALLED WITH SLOPE TO DRAIN TO CABLE VALVE, AS SPECIFIED IN SPEC. 37-1601
 - 2. REFER TO SPECIFICATION 37-1601 FOR DETAILED REQUIREMENTS FOR ALL ELECTRICAL WORK PERFORMED ON THIS PROJECT
 - 3. CONTRACTOR TO RUN ELECTRICAL CONDUITS ALONG WITH PIPING. REFER TO PIPING DRAWINGS TO COORDINATE THE WORK AND AVOID INTERFERENCES
 - 4. WELL CAP SHALL HAVE A SLOT ON THE SIDE OF THE VIBING CELL TO BRING THE CABLE OUT HORIZONTALLY. CONTRACTOR TO PROVIDE RUBBER SLEEVE OR GROMMET TO PROTECT WIRING FROM FRAYING AND CUTTING ON EDGE OF THE WELL CASING

LEGEND
— DUCT BANK



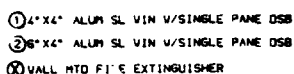
BY	DATE
CHK	DATE
APP	DATE
APPROVAL	DATE

DEPT	REV	A	B	C	D
ARCH	001	01	02	03	04
CIV/STR	002	01	02	03	04
ELECT	003	01	02	03	04
MECH	004	01	02	03	04
PLUMB	005	01	02	03	04
SAFETY	006	01	02	03	04
STRUCT	007	01	02	03	04
WATER	008	01	02	03	04
WELL	009	01	02	03	04

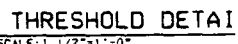
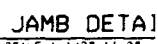
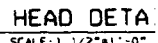
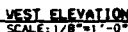
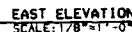
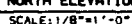
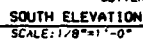
SCALE	1" = 30'	DATE	4/29/88
DRAWN BY	E. BENSON	DESIGNED BY	JHC
CHECKED BY	RFT	DATE	04/29/88
CLIENT APPROVALS			
REV	BY	DATE	

SHELL OIL COMPANY	WORK ORDER	30
ROCKY MOUNTAIN ARSENAL REMEDIATION PROJECT	2127	E
INTERIM RESPONSE ACTION FINAL DETAILED DESIGN		42
DRAWING TITLE	373-37-010	
BASIN A NECK IRA		
WELLS POWER & CONTROL		
LAYOUT & DETAILS		
REFERENCE NO.	REV	
E-010	0	

BLDG NORTH



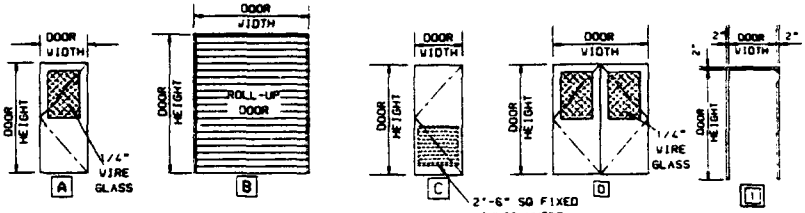
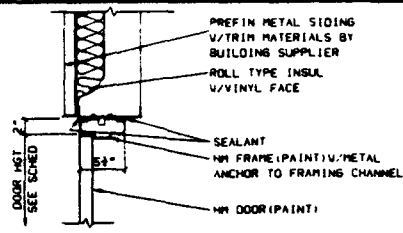
FLOOR	BASE	WALL	CEILING
1. CONC. V/SEALER	1. NONE	1. EXP. INSUL.	1. EXP. STR./INSUL.
2. CONC. V/SEALER	2. 1	2. PNT. ON GYP. BO.	2. PNT. ON GYP. BO.

[illegible]

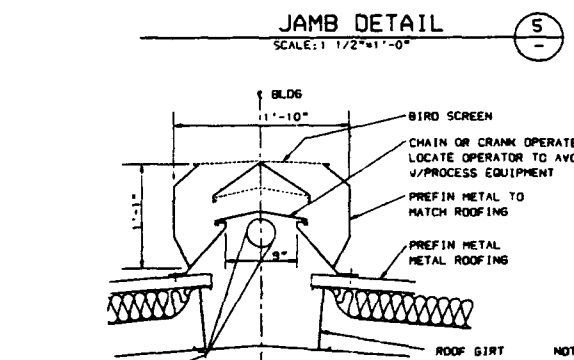
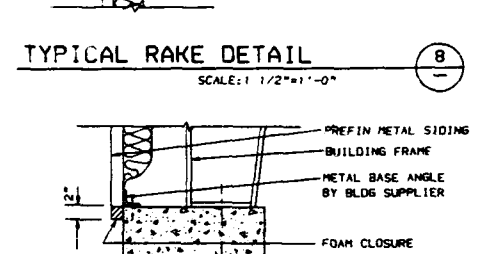
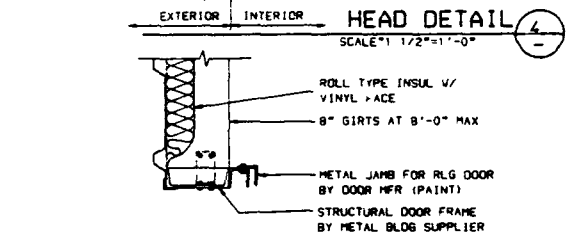
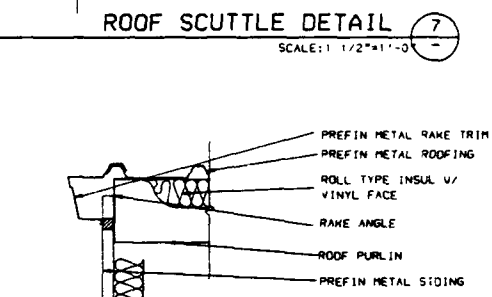
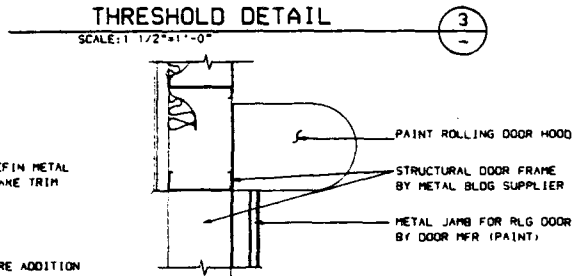
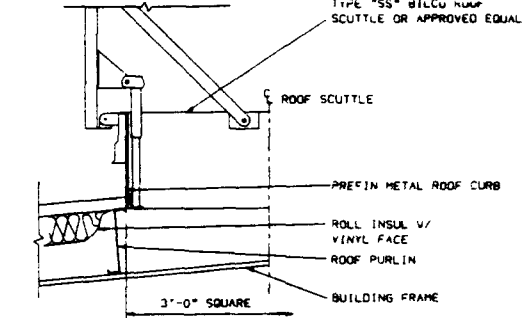
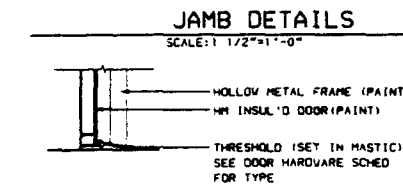
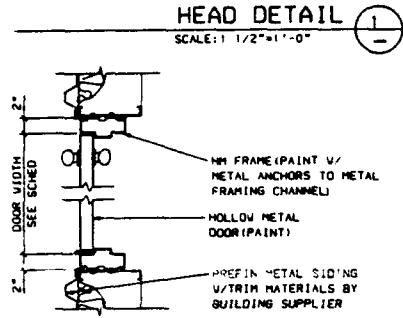
DOOR SCHEDULE

DOOR NO.	SIZE	DOOR TYPE	FRAME	DETAILS	FIRE RTG.	HOW SUP.	REMARKS
1	3'-8" x 8'-0"	1-A	HM PNT 1	HM PNT 1	2	3	
2	9'-0" x 10'-0"	1-B	NET PNT 1	INTEG NET PNT 1	1	3	INSULATED LOWER HALF LOUVER
3	3'-0" x 7'-0"	1-C	HM PNT 1	HM PNT 1	2	3	
4	2'-8" x 7'-0"	1-C	HM PNT 1	HM PNT 1	2	3	
5	3'-0" x 7'-0"	1-D	HM PNT 1	HM PNT 1	2	3	PAIR-INSULATED
6	3'-0" x 7'-0"	1-A	HM PNT 1	HM PNT 1	2	3	INSULATED

SEE SPEC 1301 SEC 7-A(3)

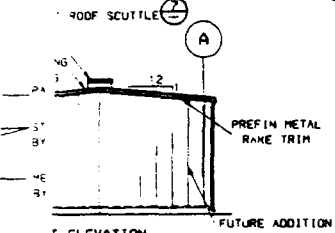


FRAME TYPE



NOTE:
1. ALL DIMENSIONS SHOWN ARE TO BE VERIFIED WITH THE PRE-ENGINEERED BUILDING MANUFACTURER PRIOR TO CONSTRUCTION.

DOOR NAME	
ROOM FINISH INDEX	SEE SCHEDULE
CEILING	
1" EXP STR/INSUL	
2" HO 1/2" PNT ON GYP HO	



- 3/4" KORTON CLOSURE
- PANEL ABOVE
- 3/4" KORTON DOORS
- 1/2" VINYL EDGING
- ADJ SHELF BRACKETS
- 3/4" KORTON SHELVES
- 1/2" VINYL EDGING
- 1/4" KORTON BACK V/ 3/4" KORTON TOP, BOT & ENDS
- (TYP CONST) VINYL EDGE
- BAND ALL EXPOSED EDGES
- PREFORMED ONE PIECE PLASTIC LAM COUNTER TOPS
- 2" ROLLED NOSE & 4" BACKSLASH
- 1/4" KORTON DRAWERS V/ ALL REQ'D HARDWARE
- 3/4" KORTON SHELVES
- 1/2" VINYL EDGE
- ADJ SHELF BRACKETS
- SOLID BLOCKING
- 3/4" KORTON DOORS & DRAWER FRONTS

ION

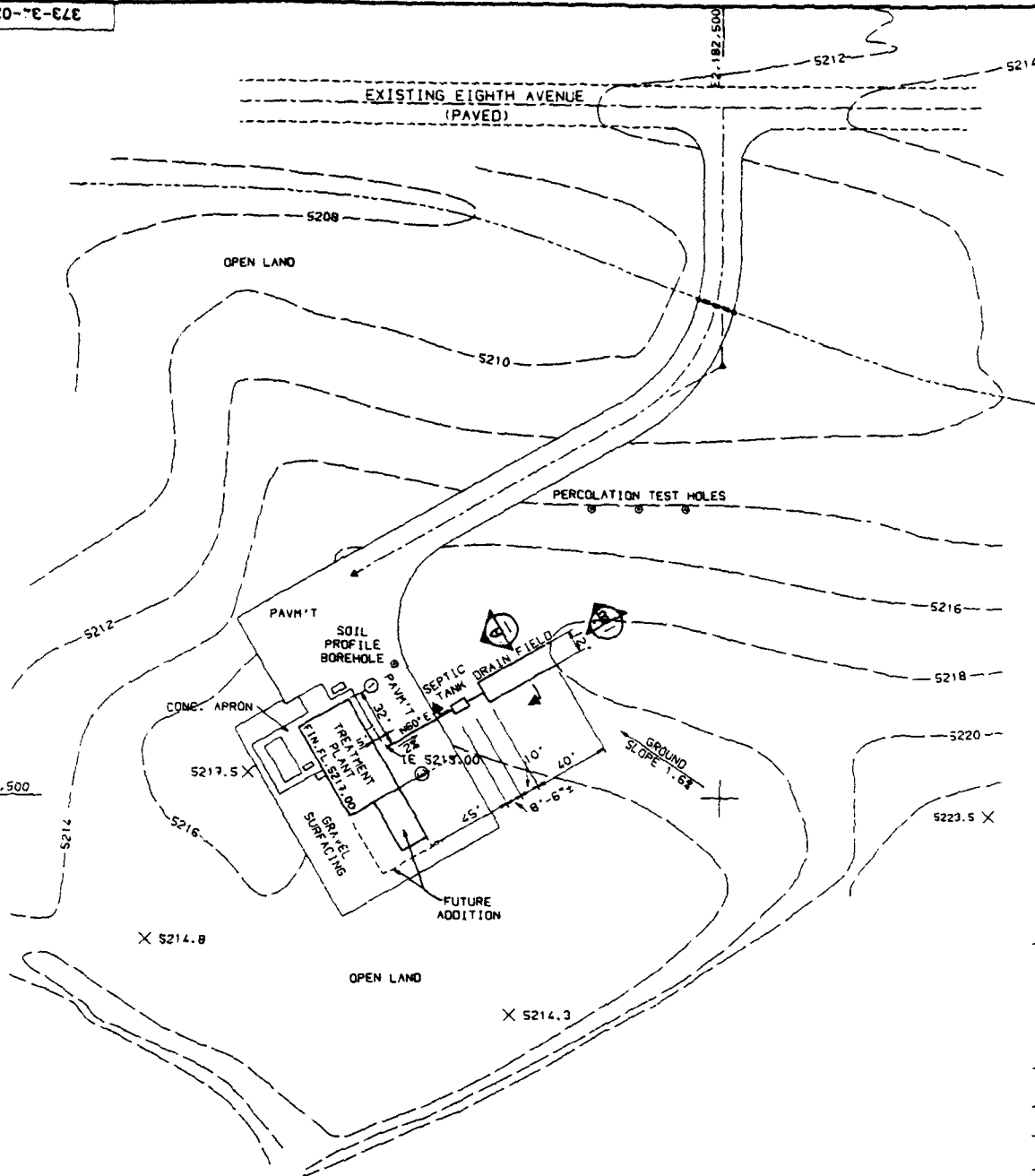
REV	BY	DATE	DESCRIPTION
1	DO	3/13/85	AS SHOWN
2	DO	3/13/85	DESIGNED BY
3	DO	4/18/85	CHECKED BY
4	DO		CLIENT APPROVALS
5	DO		REV
6	DO		BY
7	DO		DATE
8	DO		
9	DO		
10	DO		
11	DO		
12	DO		
13	DO		
14	DO		
15	DO		
16	DO		
17	DO		
18	DO		
19	DO		
20	DO		

JOHNSON-KNUDSEN ENGINEERS, INC.

SHELL OIL COMPANY
ROCKY MOUNTAIN ARSENAL REMEDIATION PROJECT
INTERIM RESPONSE ACTION FINAL DETAILED DESIGN
DRAWING TITLE
BASIN A NECK IRA
GROUND WATER TREATMENT BUILDING
PLAN & DETAILS

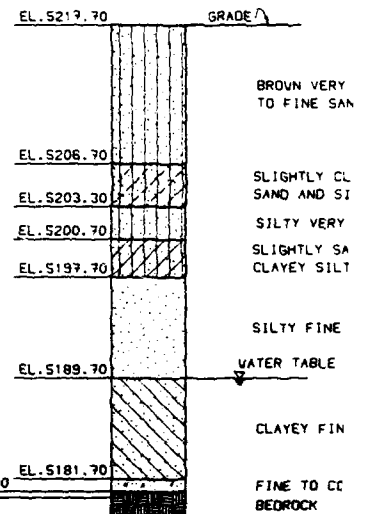
VORN ORDER	30
2127	42
DRAWING NO.	373-33-020
REFERENCE NO.	A-20
REV	0

220-3-3-022



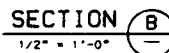
PRECAST STAMP
SEPTIC TANK
GRADE RIN
AS MANUFACTURE
CONCRETE INC
ENGINEER APPR
10' OF SOIL COVE

PLAN
1" = 30'



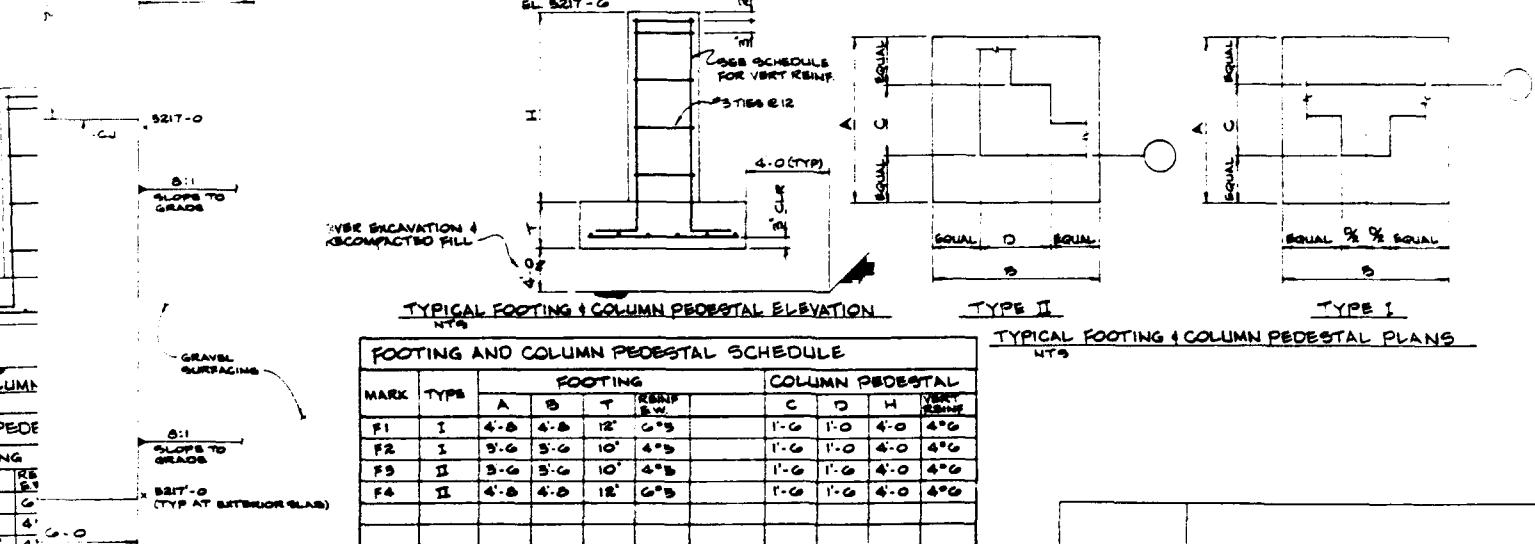
SOIL PROFILE BOREHOLE LOG

REV	BY	DATE	DESCRIPTION	REV	BY	DATE	DESCRIPTION	REV	BY	DATE	DESCRIPTION	SCALE
1	MF	8/22/88	ISSUE FOR CONSTRUCTION TLR047	1	MF	8/22/88	ISSUE FOR CONSTRUCTION TLR047	1	MF	8/22/88	ISSUE FOR CONSTRUCTION TLR047	SCALE
2	MF	5/26/88	ISSUE FOR IMPLEMENTATION PLAN TLR048	2	MF	5/26/88	ISSUE FOR IMPLEMENTATION PLAN TLR048	2	MF	5/26/88	ISSUE FOR IMPLEMENTATION PLAN TLR048	SCALE
3	MF	4/30/88	ISSUE FOR OWNER APPROVAL TLR 028	3	MF	4/30/88	ISSUE FOR OWNER APPROVAL TLR 028	3	MF	4/30/88	ISSUE FOR OWNER APPROVAL TLR 028	SCALE
4	MF	4/21/88	ISSUE FOR REVIEW & COMMENT TLR028	4	MF	4/21/88	ISSUE FOR REVIEW & COMMENT TLR028	4	MF	4/21/88	ISSUE FOR REVIEW & COMMENT TLR028	SCALE



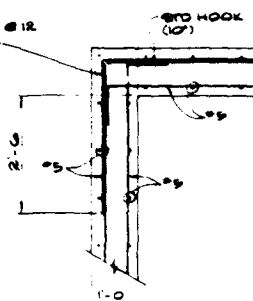
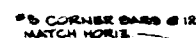
6. SEE DRAWING C-003 FOR DETAILS ON PLANT LAYOUT AND GRADING.

8/10/69 00-34-022 PLOT

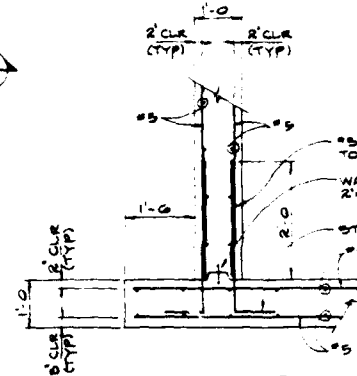
[illegible]

NOTE: 1. ANCHOR BOLTS BY BUILDING & EQUIPMENT VENDORS
2. SEE PIPING DRAWING FOR SCHED DETAILS AND E ELEVATIONS.

[illegible]

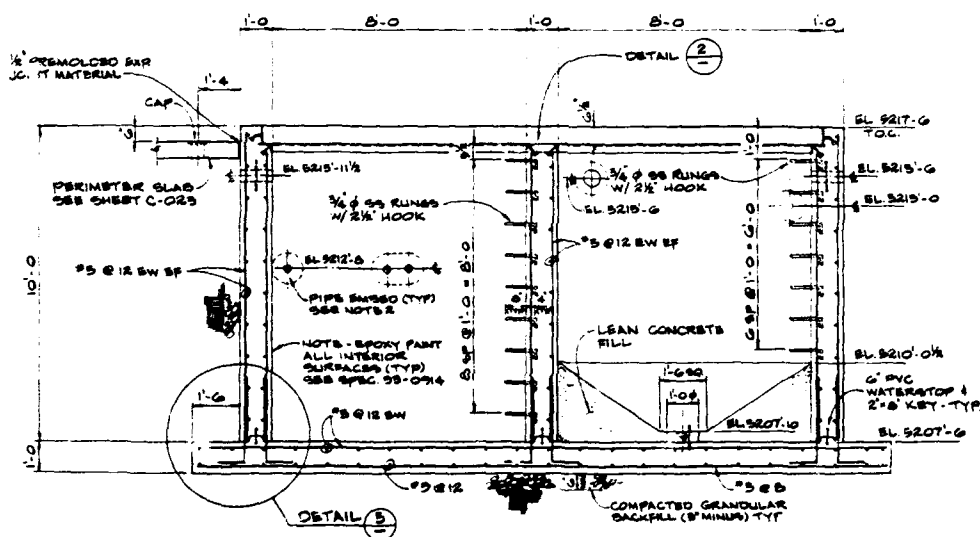


TYPICAL CORNER

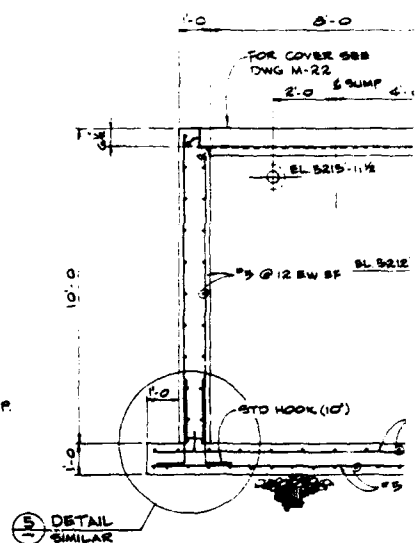


DETAIL 5
3/4" = 1'-0"

INFLUENT AND WASTEWATER SUMP FOUNDATION PLAN
1/4" = 1'-0"



SECTION $\frac{1}{2}$ -1'-0' (A)



SECTION (B)
1/2 = 1-0

[illegible]

#5 CORNER BARS @ 12" MATCH HORIZ.

#5 HOOK (10")

#5 CORNER BARS @ 12" MATCH HORIZ.

EL 5217'-6"

GALVANIZED
#5 1/2" x 6" w/ 1/2" x 4"
STUDS @ 2'-0" O.C. AND
2" x 3" w/ 1/2" x 4"
STUDS @ 2'-0" O.C.
1/2" x 3" REPLACABLE
TEFLON PAD

TYPICAL DETAIL (1)
1 1/2" x 1'-0"

EL 5216'-1 1/2" T.O.C.

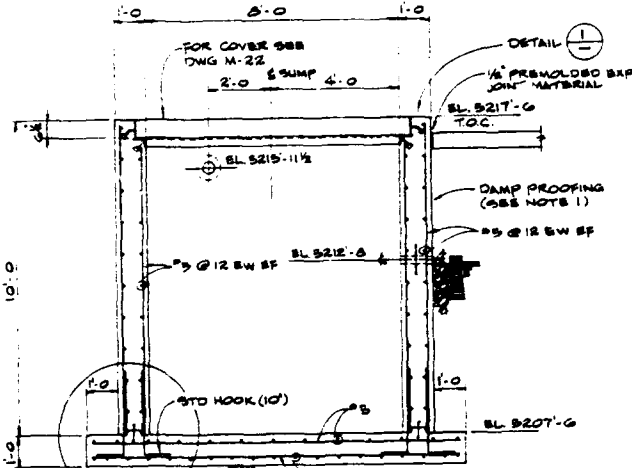
1/2" x 5'-6" REPLACABLE
TEFLON BEARING PAD AT C.C.
GALVANIZED
2" x 2" w/ 1/2" x 4"
STUDS @ 2'-0" O.C.

DETAIL (2)
1 1/2" x 1'-0"

NOTES

1. DAMPPROOF EXTERIOR EXPOSED CONCRETE TO ELEVATION 5217'-0" (SEE SPECIFICATION 95-0706 FOR DETAILS)
2. SEE PIPING DRAWINGS FOR BMSD DETAILS

DETAIL (5)
3/4" x 1'-0"



SECTION B-B
1/2" x 1'-0"

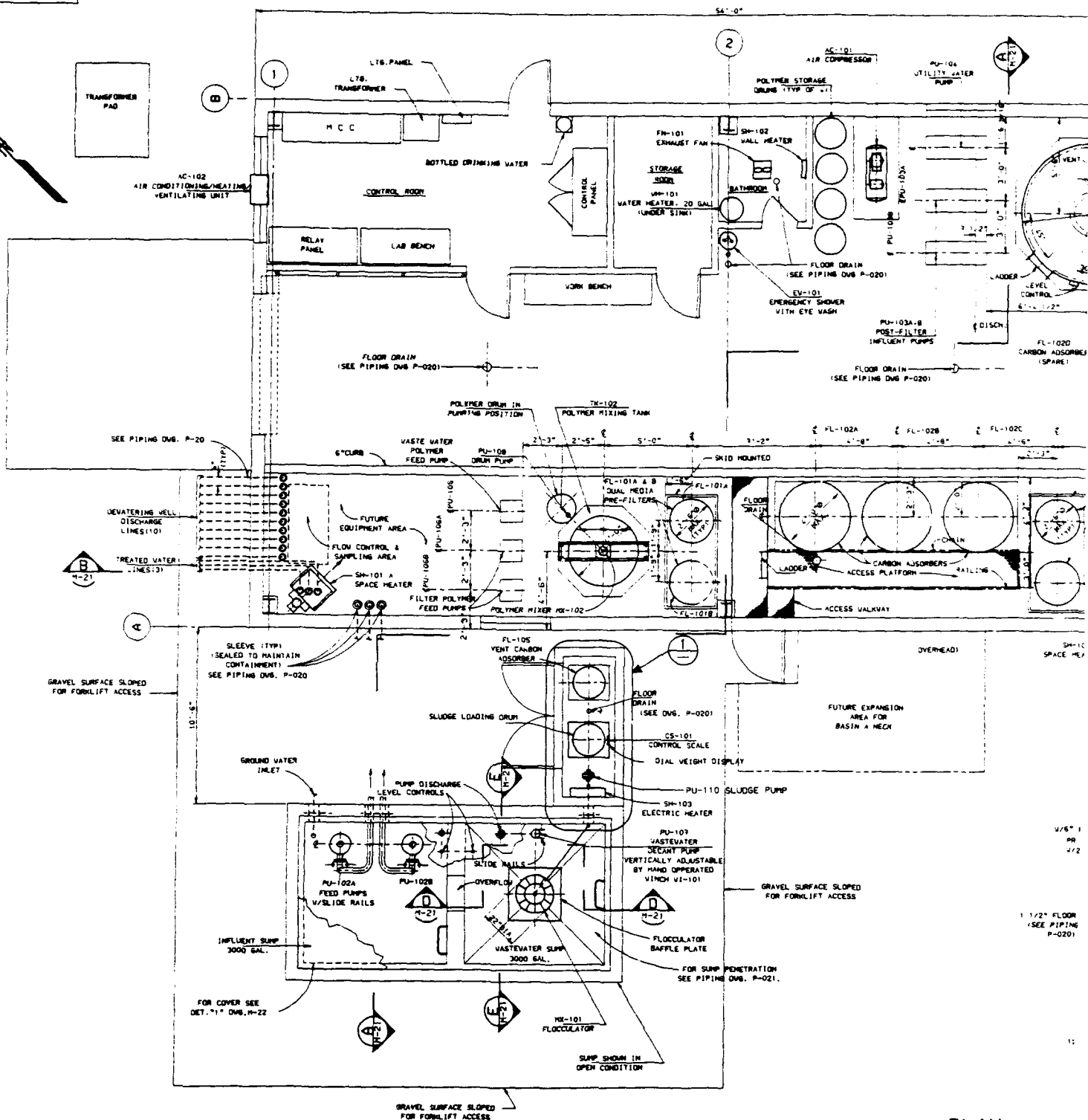
DETAIL (5) SIMILAR

DEPT	REV	DATE	BY	DATE
ARCH	A	4-14-89	CGV	4-14-89
CIV/STR	B	4-14-89	CGV	4-14-89
MCH	C	4-14-89	CGV	4-14-89
ELECT	D	4-14-89	CGV	4-14-89
INSTR	E	4-14-89	CGV	4-14-89
PIPING	F	4-14-89	CGV	4-14-89
SAFETY	G	4-14-89	CGV	4-14-89
DEPT MGR	H	4-14-89	CGV	4-14-89
PROJECT	I	4-14-89	CGV	4-14-89

SCALE AS NOTED
DRAWN BY CGV
DESIGNED BY GJS
CHECKED BY CGV
CLIENT APPROVALS
REV: BY DATE

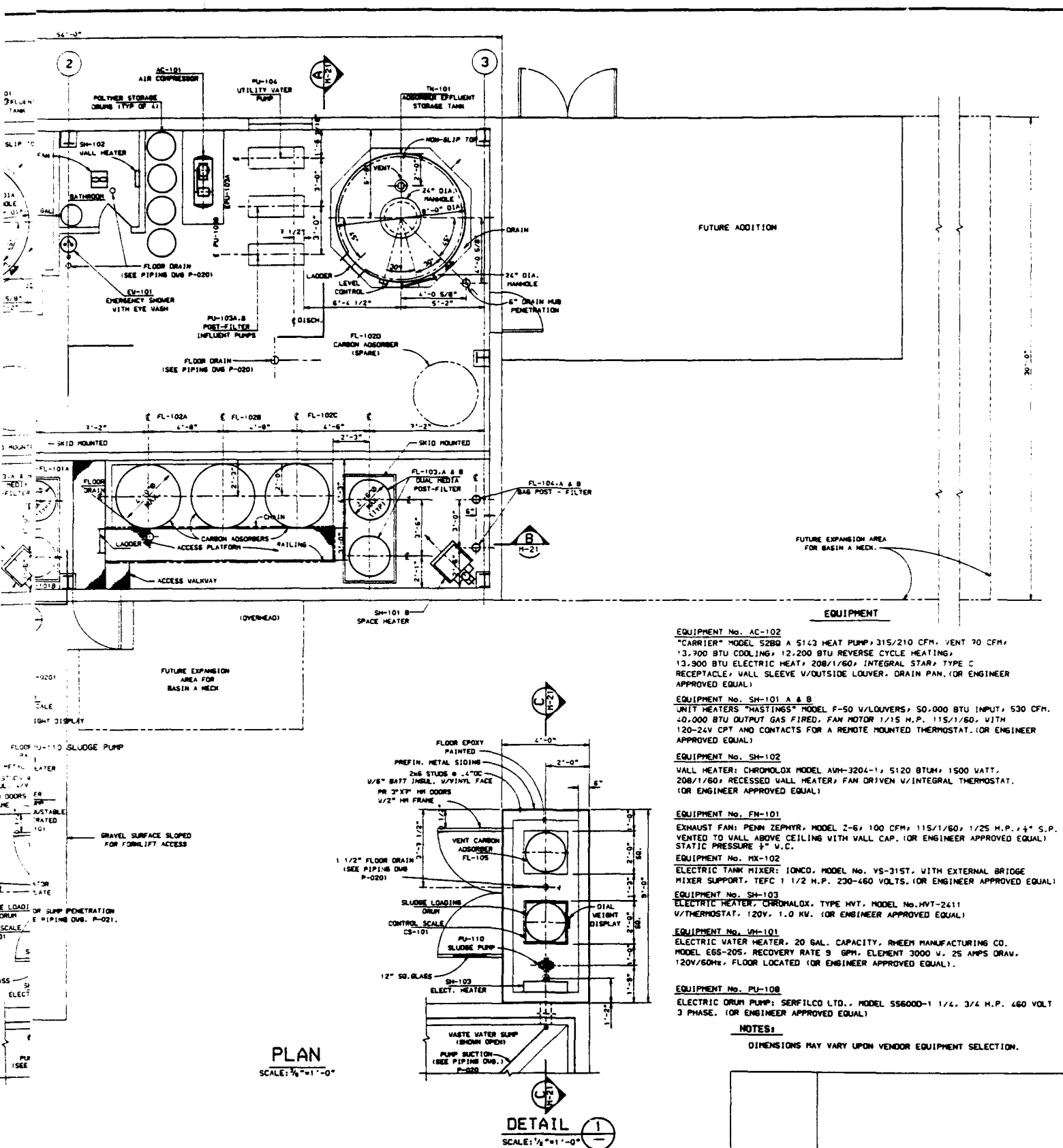
SHELL OIL COMPANY ROCKY MOUNTAIN ARSENAL REMEDIATION PROJECT INTERIM RESPONSE ACTION FINAL DETAILED DESIGN	WORK ORDER NO. 2127	30 1 42
DRAWING TITLE BASIN A NECK IRA INFLUENT & WASTEWATER SUMP PLAN, SECTIONS & DETAILS	373-34-024	REV C-024 0

373-36-020



PLAN
SCALE: 1/8" = 1'-0"

NO.	BY	DATE	DESCRIPTION	NO.	BY	DATE	DESCRIPTION	DEPT	REV	A	B	C	D	SCALE
1	JTF	8/22/89	ISSUE FOR CONSTRUCTION TLR 047	1	JTF	8/22/89	ISSUE FOR CONSTRUCTION TLR 047	ARCH	REV	A	B	C	D	SCALE
2	JTF	8/22/89	FOR IMPLEMENTATION PLAN TLR 045	2	JTF	8/22/89	FOR IMPLEMENTATION PLAN TLR 045	CIV/STR	REV	A	B	C	D	SCALE
3	JTF	4/20/89	ISSUED FOR APPROVAL TLR 026	3	JTF	4/20/89	ISSUED FOR APPROVAL TLR 026	MCH	REV	A	B	C	D	SCALE
4	JTF	3/11/89	ISSUED FOR REVIEW & COMMENT TLR NO. 012	4	JTF	3/11/89	ISSUED FOR REVIEW & COMMENT TLR NO. 012	ELECT	REV	A	B	C	D	SCALE
5	JTF	3/11/89	ISSUED FOR REVIEW & COMMENT TLR NO. 012	5	JTF	3/11/89	ISSUED FOR REVIEW & COMMENT TLR NO. 012	INST	REV	A	B	C	D	SCALE
6	JTF	3/11/89	ISSUED FOR REVIEW & COMMENT TLR NO. 012	6	JTF	3/11/89	ISSUED FOR REVIEW & COMMENT TLR NO. 012	SAFETY	REV	A	B	C	D	SCALE
7	JTF	3/11/89	ISSUED FOR REVIEW & COMMENT TLR NO. 012	7	JTF	3/11/89	ISSUED FOR REVIEW & COMMENT TLR NO. 012	DEPT	REV	A	B	C	D	SCALE
8	JTF	3/11/89	ISSUED FOR REVIEW & COMMENT TLR NO. 012	8	JTF	3/11/89	ISSUED FOR REVIEW & COMMENT TLR NO. 012	PROJECT	REV	A	B	C	D	SCALE



EQUIPMENT No. AC-101

"CARRIER" MODEL 5280 A 51/2" HEAT PUMP, 315/210 CFM, VENT 70 CFM, 13,700 BTU COOLING, 12,200 BTU REVERSE CYCLE HEATING, 13,900 BTU ELECTRIC HEAT, 208/1/60, INTEGRAL STAR, TYPE C RECEPTACLE, WALL SLEEVE W/OUTSIDE LOUVER, DRAIN PAN, (OR ENGINEER APPROVED EQUAL)

EQUIPMENT No. SH-101 A & B

JUNIT HEATERS "HASTINGS" MODEL F-50 W/LOUVERS, 50,000 BTU INPUT, 530 CFM, 10,000 BTU OUTPUT GAS FIRED, FAN MOTOR 1/15 H.P., 115/1/60, WITH 120-24V CPT AND CONTACTS FOR A REMOTE MOUNTED THERMOSTAT, (OR ENGINEER APPROVED EQUAL)

EQUIPMENT No. SH-102

WALL HEATER: CHROMOLOX MODEL AMH-3204-1, 5120 BTUH, 1500 WATT, 208/1/60, RECESSED WALL HEATER, FAN DRIVEN W/INTEGRAL THERMOSTAT, (OR ENGINEER APPROVED EQUAL)

EQUIPMENT No. FM-101

EXHAUST FAN: PENN ZEPHYR, MODEL Z-6, 100 CFM, 115/1/60, 1/25 H.P., 1/4" S.P., VENTED TO WALL ABOVE CEILING WITH WALL CAP, (OR ENGINEER APPROVED EQUAL) STATIC PRESSURE 3" W.C.

EQUIPMENT No. MX-102

ELECTRIC TANK MIXER: IONCO, MODEL No. VS-31ST, WITH EXTERNAL BRIDGE MIXER SUPPORT, TEFC 1 1/2 H.P., 230-460 VOLTS, (OR ENGINEER APPROVED EQUAL)

EQUIPMENT No. SH-103

ELECTRIC HEATER, CHROMOLOX, TYPE HWT, MODEL No. HWT-2411 W/THERMOSTAT, 120V, 1.0 KW, (OR ENGINEER APPROVED EQUAL)

EQUIPMENT No. VH-101

ELECTRIC WATER HEATER, 20 GAL. CAPACITY, RHEEN MANUFACTURING CO. MODEL EGS-20S, RECOVERY RATE 9 GPM, ELEMENT 3000 V, 25 AMPS DRAW, 120V/60Hz, FLOOR LOCATED (OR ENGINEER APPROVED EQUAL)

EQUIPMENT No. PU-108

ELECTRIC DRUM PUMP: SERFILCO LTD., MODEL SS6000-1 1/4, 3/4 H.P., 460 VOLT 3 PHASE, (OR ENGINEER APPROVED EQUAL)

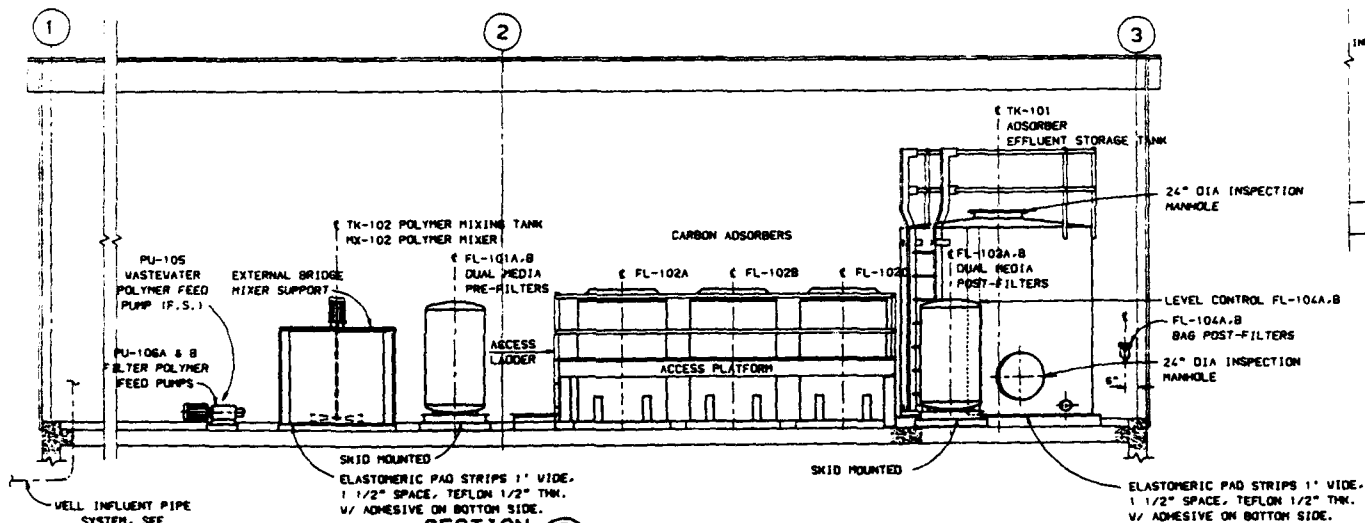
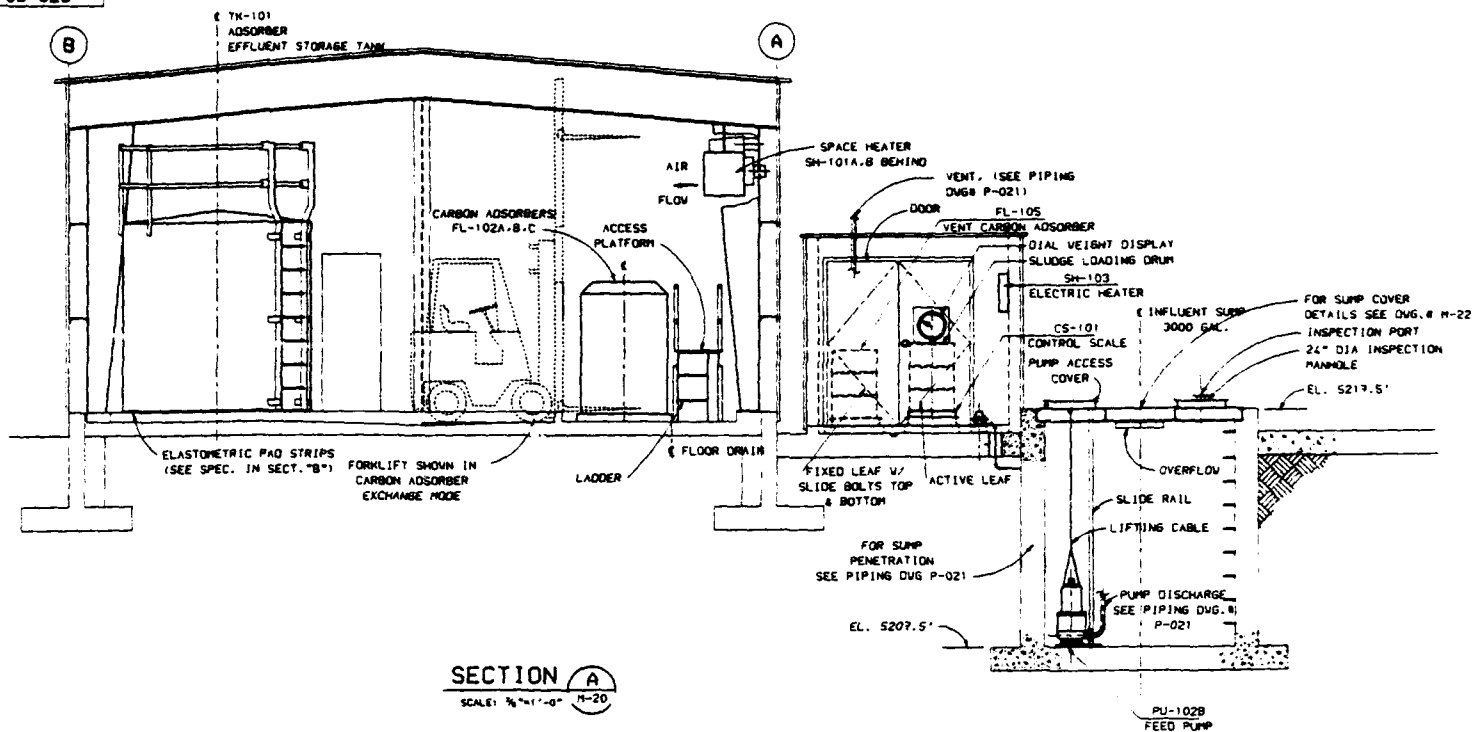
NOTES:

DIMENSIONS MAY VARY UPON VENDOR EQUIPMENT SELECTION.

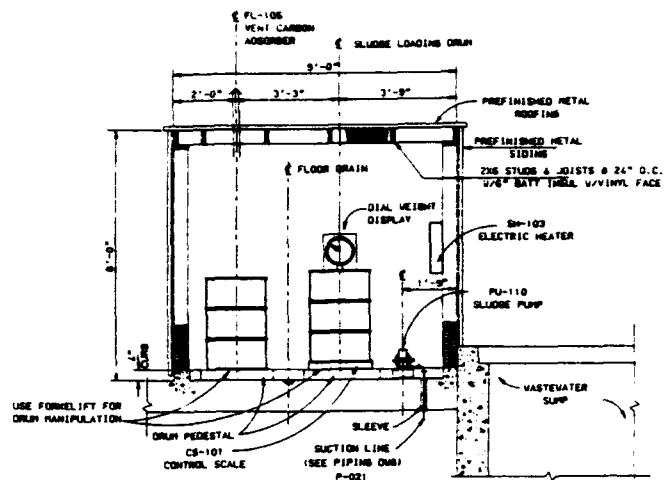
DEPT	REV	A	B	C	D	SCALE	AS NOTED	DATE
ARCH								
CIV/STR								
MCH								
ELECT								
INSTR								
PIPE								
SAFETY								
DEPT MGR								
PROJECT								

SCALE	AS NOTED	DATE
DRAWN BY	CVF	3/89
DESIGNED BY	SJA	3/89
CHECKED BY	JTF	3/89
CLIENT APPROVALS	BY	DATE

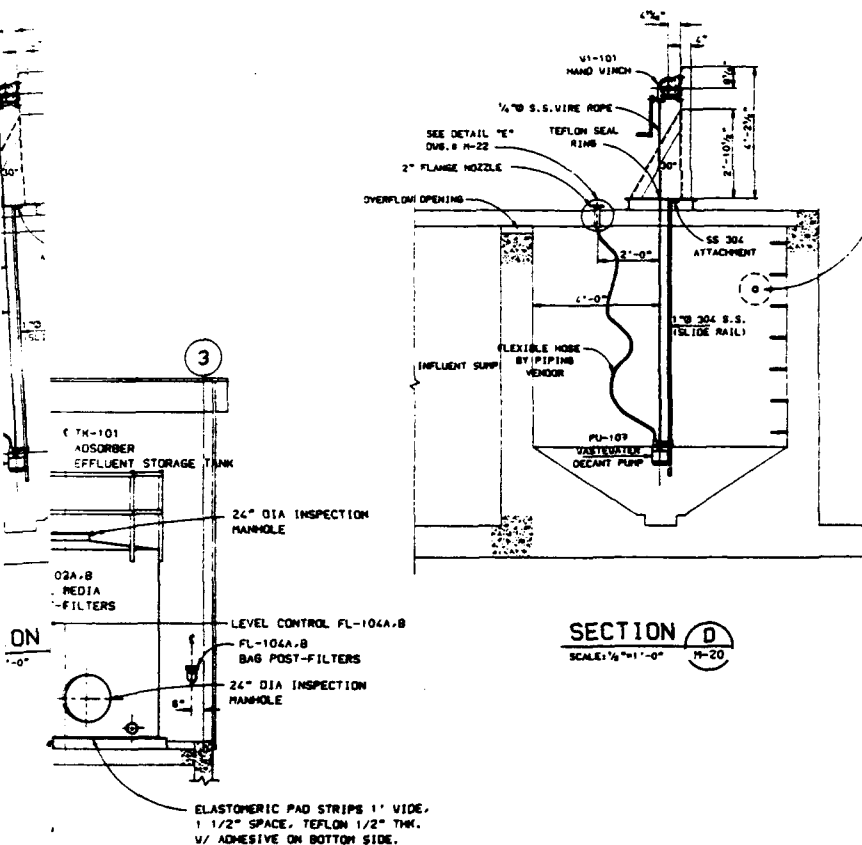
SHELL OIL COMPANY		WORK ORDER	30
ROCKY MOUNTAIN ARSENAL REDEMPTION PROJECT		2127	42
INTERIM RESPONSE ACTION FINAL DETAILED DESIGN			
DRAWING TITLE		DRAWING NO.	
BASIN A NECK IRA		373-36-020	
GROUND WATER TREATMENT SYSTEM		REFERENCE NO.	
GENERAL ARRANGEMENT PLAN		M-20	0



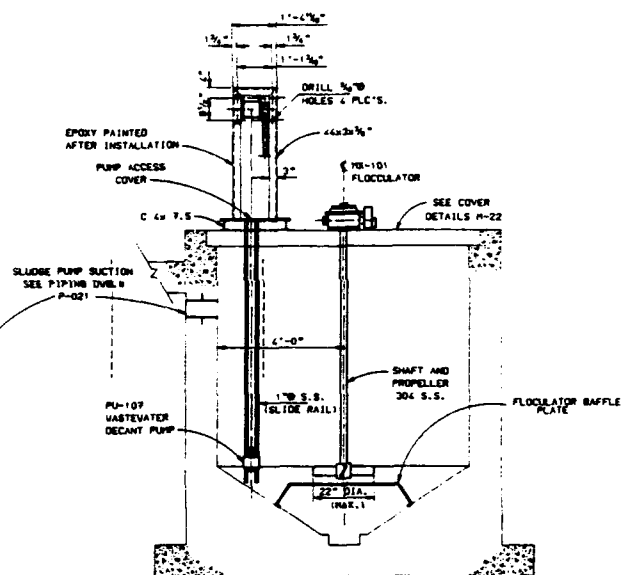
REFERENCE DWG.	NO.	BY	DATE	CHD.	DESCRIPTION	NO.	BY	DATE	CHD.	DESCRIPTION	DEPT.	REV.	A	B	C	D	SCALE
P-21	PIPING DWG.										ARCH.						GRAPH.
P-20	PIPING DWG.										CIV/STN.						DWG.
I-20	P. & I. G.										MECH.						DWG.
P-22	GENERAL ARRANGEMENT - DETAILS										ELECT.						DWG.
P-20	GENERAL ARRANGEMENT NO. 1										INSTR.						DWG.
											PIPING						DWG.
											SAFETY						DWG.
											DEPT. MGR.						REV.
											PROJECT						



SECTION C
SCALE: 1/2" = 1'-0" M-20



SECTION D
SCALE: 1/8" = 1'-0" 19-20



SECTION E
SCALE: 1/2" = 1'-0" M-20
EQUIPMENT

EQUIPMENT No. CS-101

CONTROL SCALE; MOORE RICHARDSON SCALE CO. XL DIAL MODEL # 8401 BENCH TYPE.
28"x28" STAINLESS STEEL PAN, 1000 LB CAPACITY. (OR ENGINEER APPROVED EQUAL)

EQUIPMENT No. FL-105
VENT CARBON ADSORBER, TINE CORP. "CANORS" MODEL C150P (150 LB. CARBON CAPACITY)
OR ENGINEER APPROVED EQUAL.

EQUIPMENT No. VI-101
HAND WINCH, PULLING CAPACITY 750 LB., DRUM SIZE 6"X8", GEAR RATIO 25:1.
STEPHEN ADAMSON R30 OR ENGINEER APPROVED EQUAL.

NOTES:

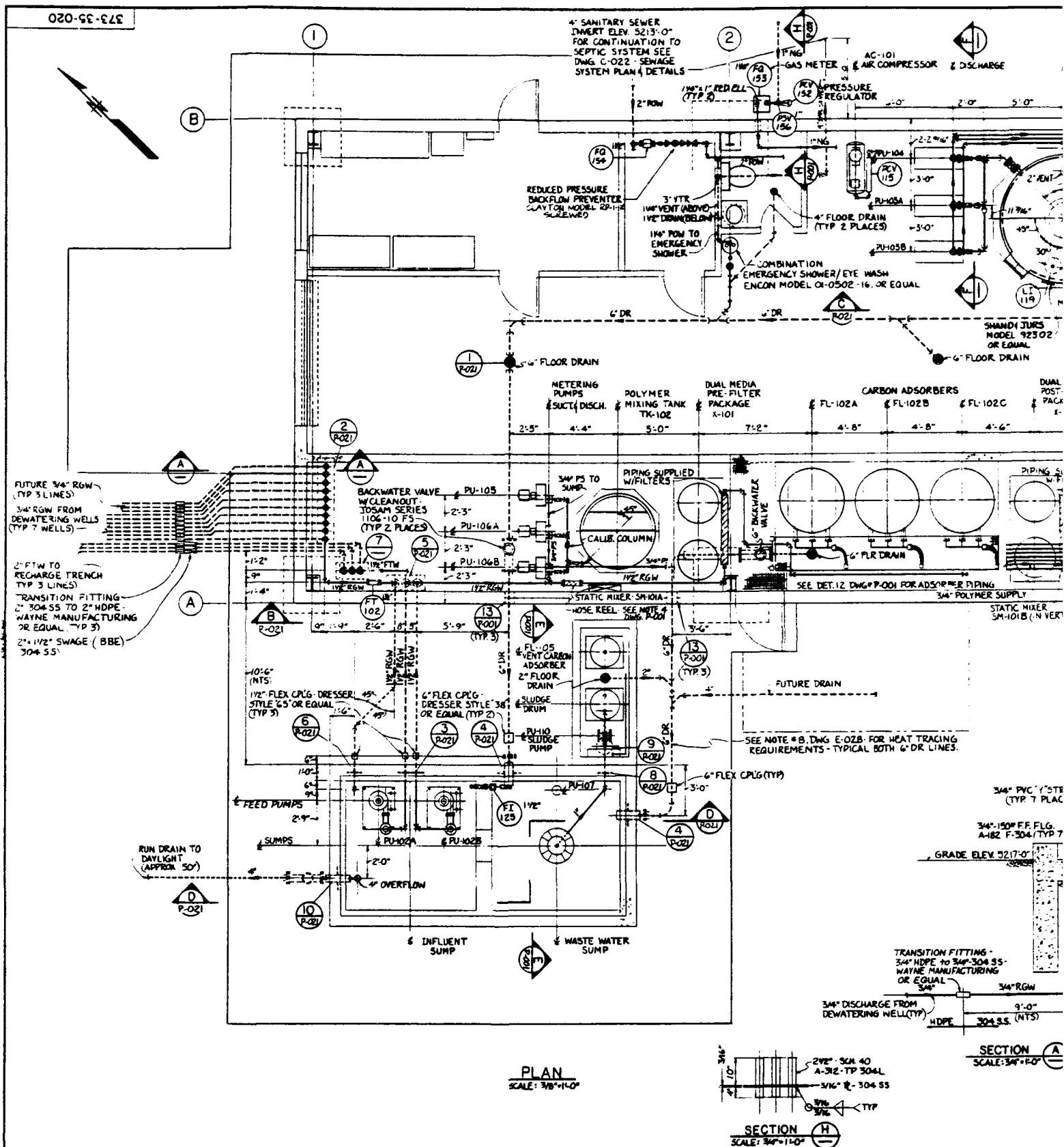
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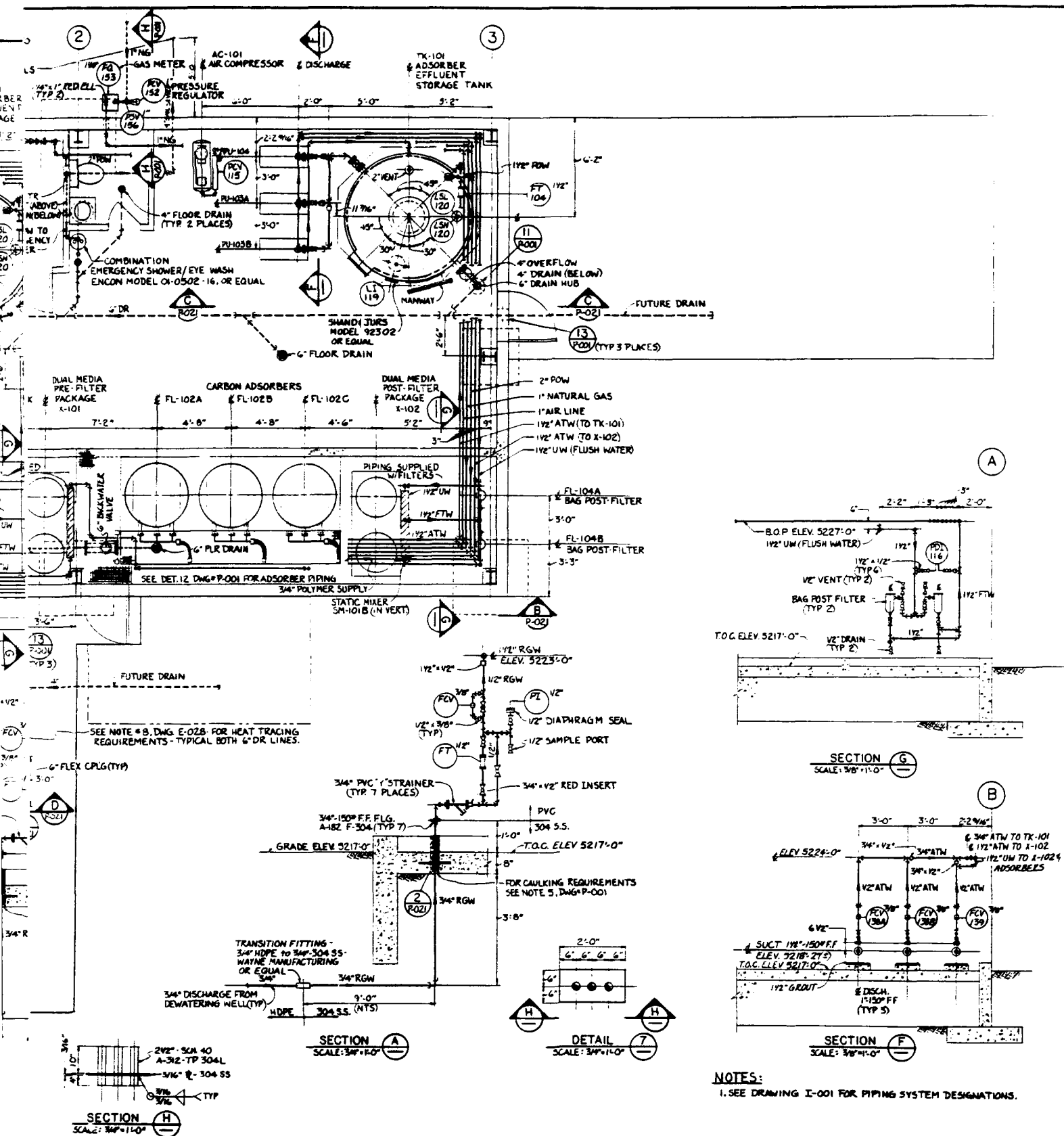
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CUF	ARCH			DEC	86	3/8	DRAWN BY	CHP	3/86
SJA	CLAY/ETH			JTF	JTF	3/86	DESIGNED BY	JJA	3/86
JTF	SELECT			JMC	JMC	3/86	CHECKED BY	JTF	3/86
APPROV	INSTR			DEC	86	3/86	CLIENT APPROVALS		
BY	PIPING			JVM	86	3/86	REV	BY	DATE
	SAFETY								
	STRUCTURE TLR 047								
	FOUNDATION TLR 048								
	ROYAL TLR 058								
	QUARRY TLR 012								
	DESCRIPTION								

MORRISON-KNUDSEN ENGINEERS, INC.
A HARRISON-CLARK COMPANY

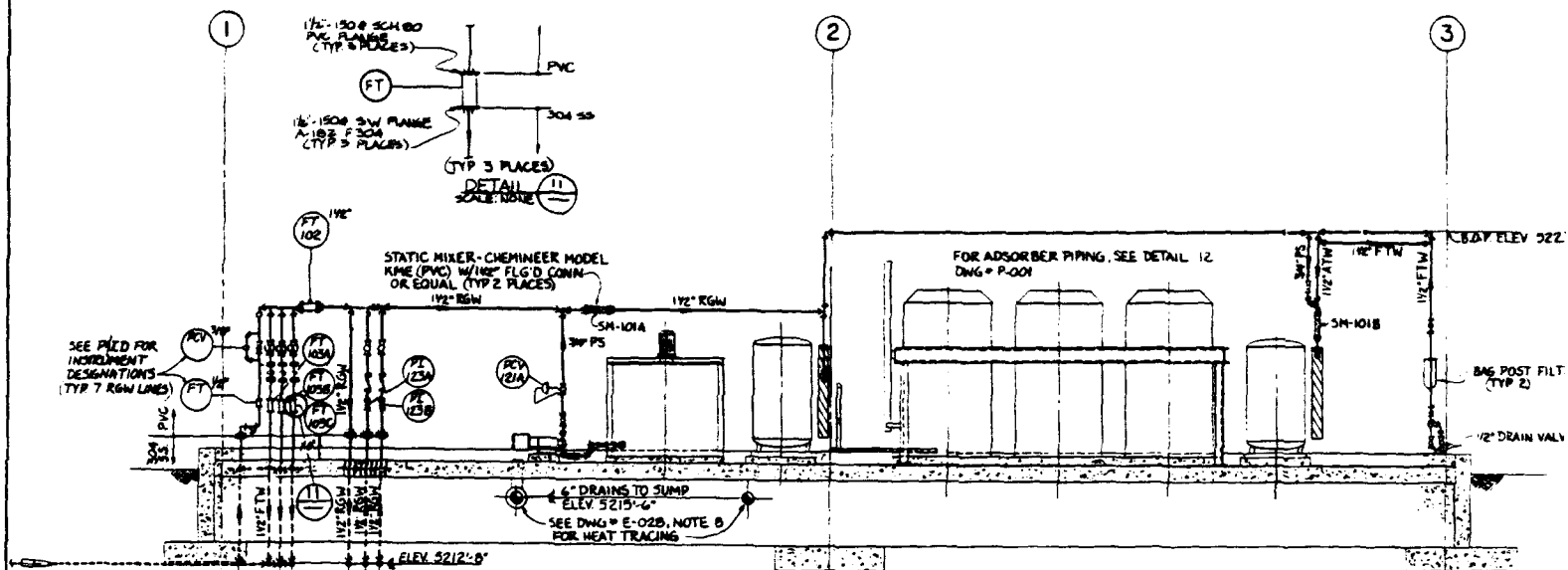
SHELL OIL COMPANY
ROCKY MOUNTAIN ARSENAL REMEDIATION PROJECT
INTERIM RESPONSE ACTION FINAL DETAILED DESIGN
DRAWING TITLE BASIN A NECK IRA
GROUND WATER TREATMENT SYSTEM
GENERAL ARRANGEMENT
SECTIONS

WORK ORDER	30
2127	42
DRAWING NO.	
373-36-021	
REFERENCE NO.	REV
M-21	0

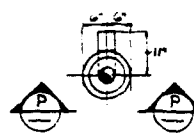
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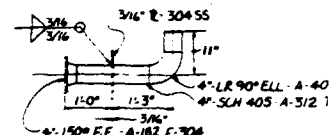
SHEET NO. 30		REV. 42	
DRAWING NO. 373-35-020		REFERENCE NO. P-020	
WORK ORDER 2127		REV. 0	
SHELL OIL COMPANY ROCKY MOUNTAIN ARSENAL REMEDIATION PROJECT INTERIM RESPONSE ACTION FINAL DETAILED DESIGN			
DRAWING TITLE BASIN A NECK IRA PIPING & PLUMBING PLANS, ARRANGEMENT & DETAILS			
MORRISON-KNUDSEN ENGINEERS, INC. A CORPORATION OF THE STATE OF CALIFORNIA			
SCALE 3/8"=1'-0" DATE 4/1/89 DRAWN BY DLS DESIGNED BY DLS CHECKED BY SP CLIENT APPROVALS REV. BY DATE			
SHEET NO. 30 PROJECT 373-35-020 DESCRIPTION			
REVISIONS REV. DATE BY CHKD.			
1 4/1/89 DLS DLS 2 4/1/89 DLS DLS 3 4/1/89 DLS DLS 4 4/1/89 DLS DLS			
APPROVALS SHEET NO. 30 			



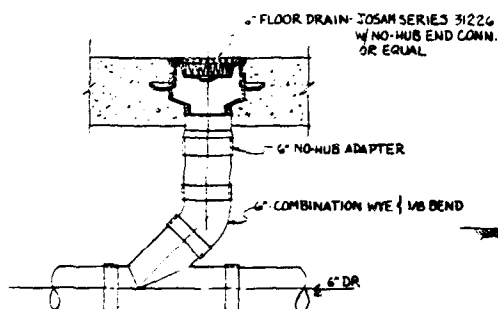
SECTION 8
SCALE: 3/8" = 1'-0" P-020





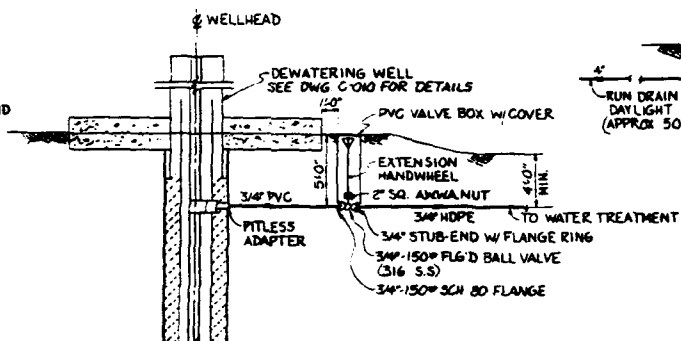
DETAIL
SCALE: 3/4"=1'-0" P-020



SECTION (P)
SCALE: 3/4" = 1'-0"

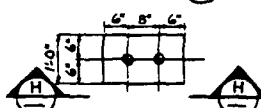


DETAIL 
SCALE: NONE 

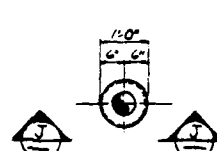


TYPICAL 7 DEWATERING WELLS

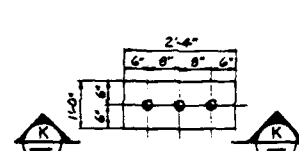
SECTION D
SCALE: NONE P-010



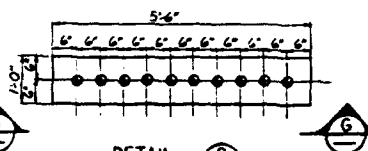
DETAIL 
SCALE: 3/4" = 1'-0" R-020



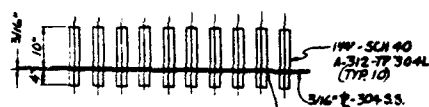
DETAIL 4
SCALE: 3/4" = 1'-0" P-026



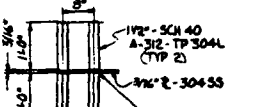
DETAIL 5
SCALE: 3/4" = 1'-0" P-02




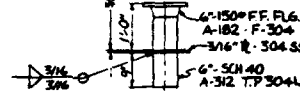
DETAIL 2
SCALE: 3/4"=1'-0" P-020



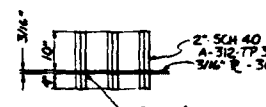
SECTION G
SCALE: 3/4" = 1'-0"



SECTION  H
SCALE: 1"=10'

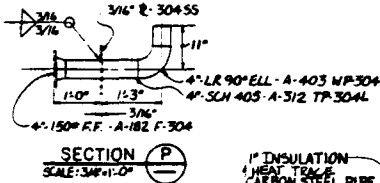
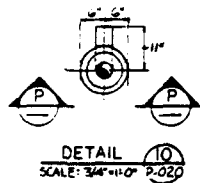
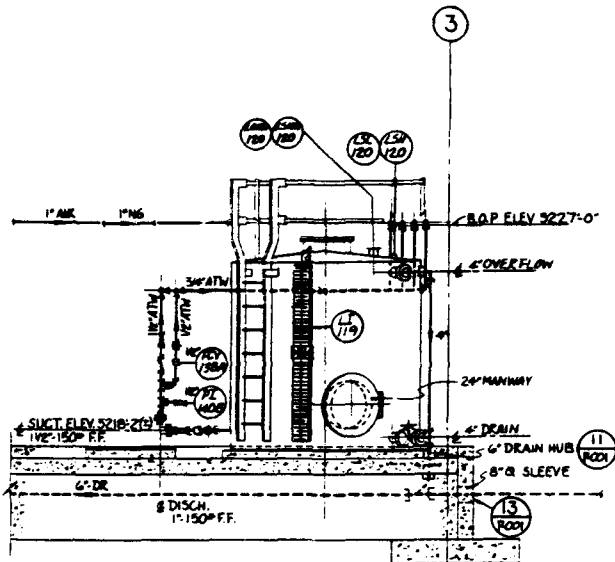
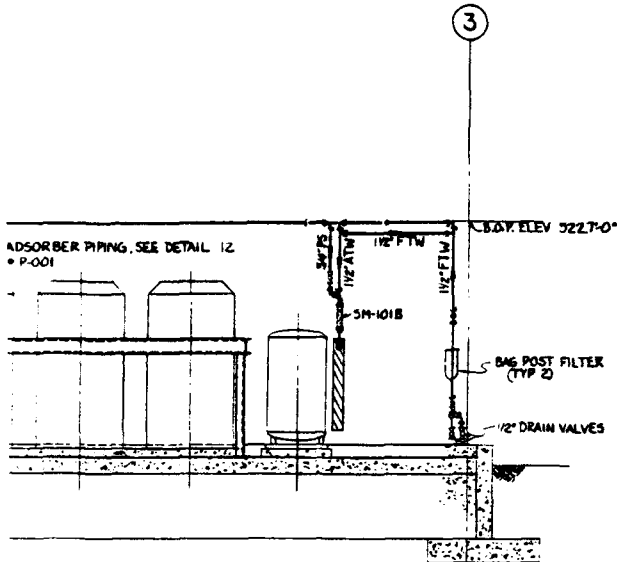


TYPICAL 2 PLACES
SECTION

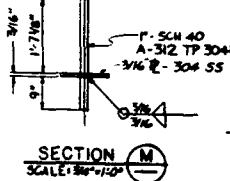
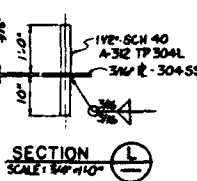
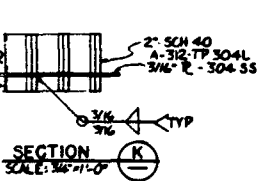
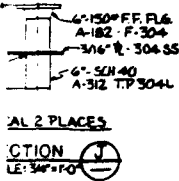
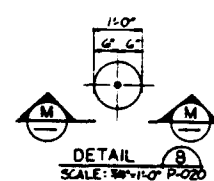
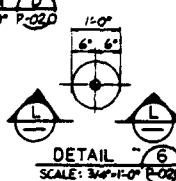
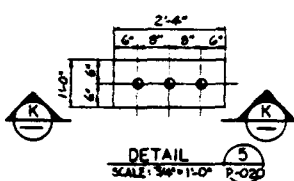
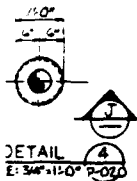
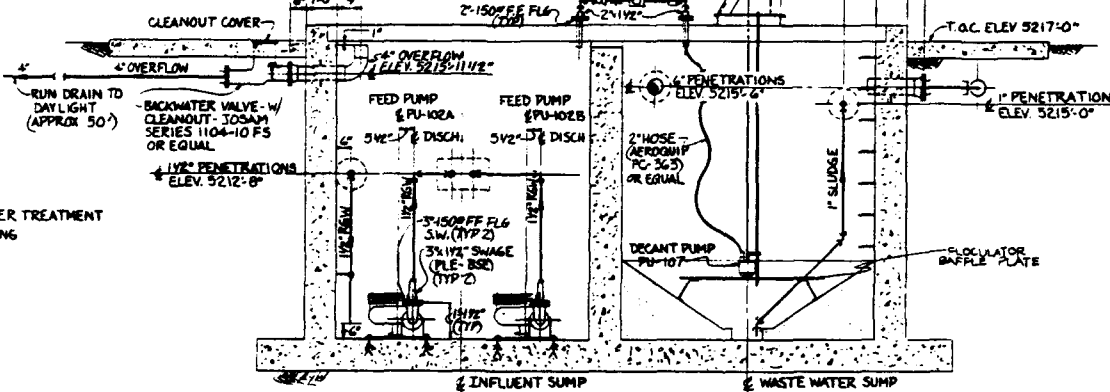
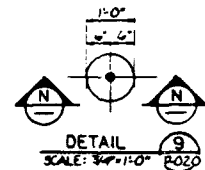


SECTION (K)
SCALE: 3/4" = 1'-0"

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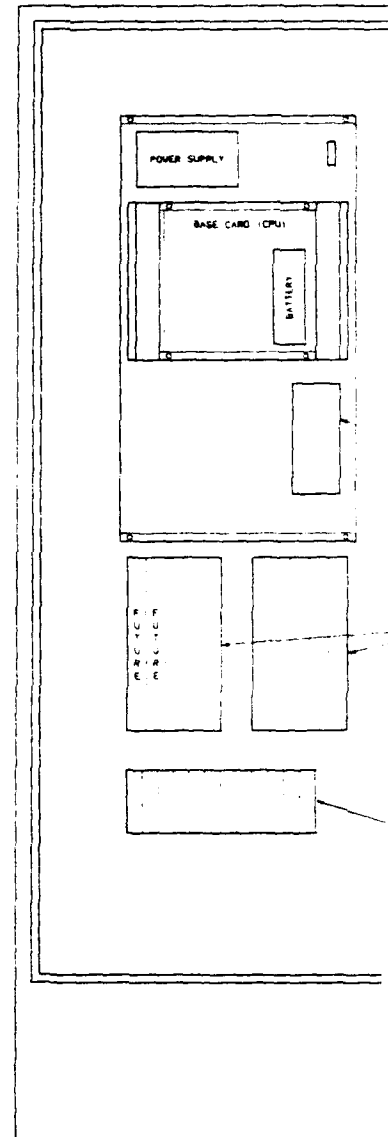
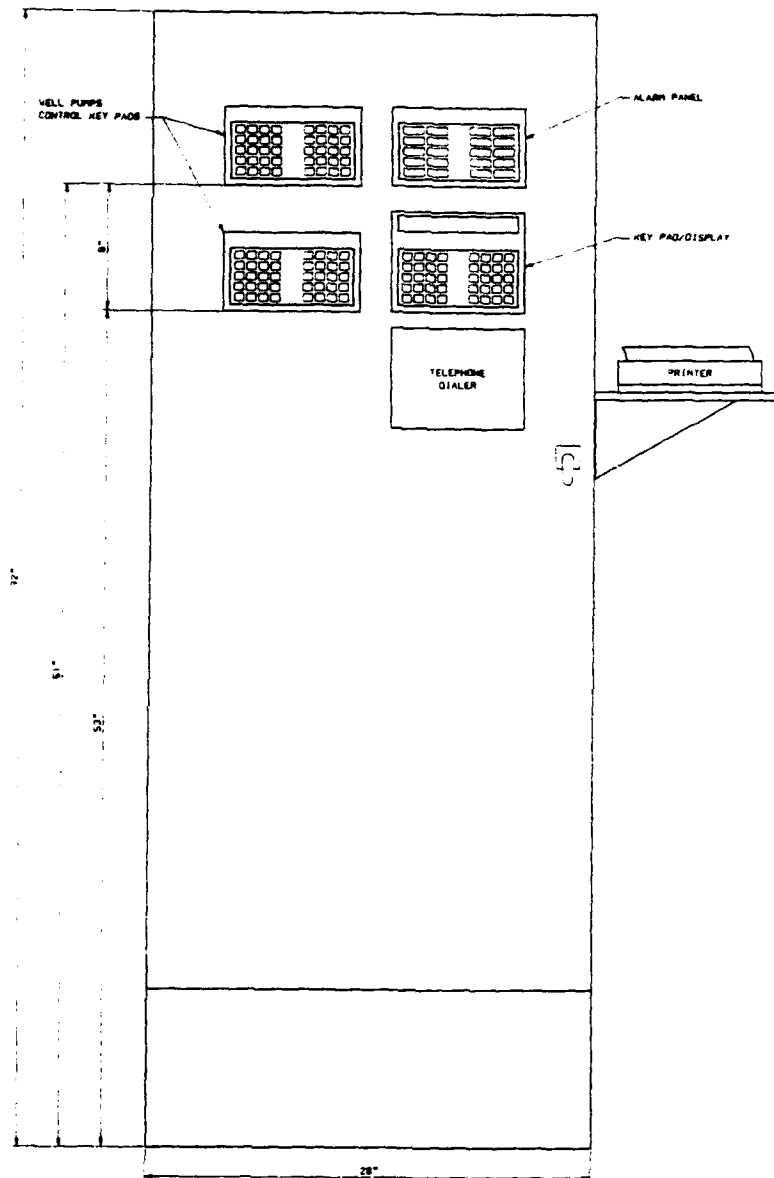


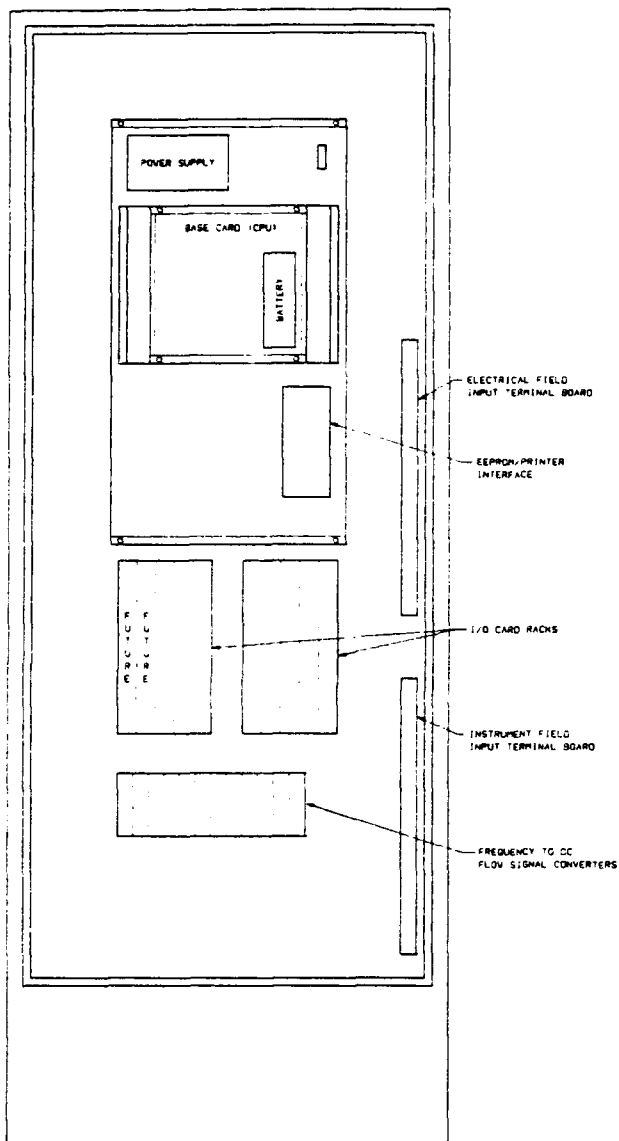
SECTION C
SCALE: 3/4\"/>



NOTE:
1. SEE DRAWING I-001 FOR
PIPING SYSTEM
DESIGNATIONS.

SECTION T.L.# 047 DESIGN APPROVAL IN PLAN T.L.# 048 W.C. CAMPBELL T.L.# 028 DESCRIPTION	REV	A	B	C	SCALE AS NOTED	DATE
	DESIGNED BY	DLS			DESIGNED BY	DLS
	CHECKED BY	DLS			CHECKED BY	SP
	CLIENT APPROVALS				REV:	BY
	DATE				DATE	
	PIPELINE					
	PIPING					
	PLUMBING					
	SECTIONS					
	DETAILS					
ROCKWELL-KIDDER ENGINEERS, INC. A MEMBER OF THE KIDDER GROUP						
SHELL OIL COMPANY ROCKY MOUNTAIN ARSENAL REMEDIATION PROJECT INTERIM RESPONSE ACTION FINAL DETAILED DESIGN						
DRAWING TITLE BASIN A NECK IRA PIPING & PLUMBING SECTIONS & DETAILS						
WORK ORDER 2127						
DRAWING NO. 373-35-021						
REFERENCE NO. P-021						
REV 0						

[illegible]



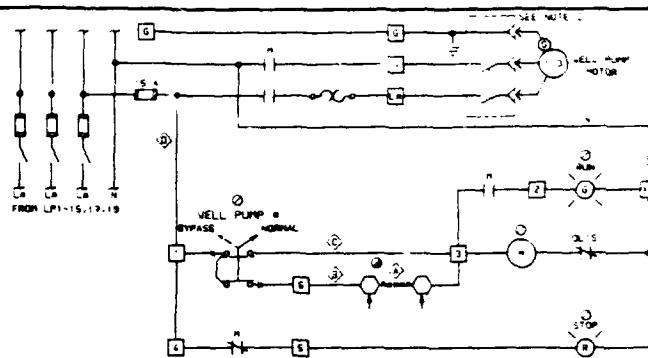
VIEW W/O DOOR

NOTES:

1. THIS PANEL CONFIGURATION IS BASED ON A PROPOSAL BY AUTOCON FOR A MICRO/PT CLASS 550B PUMP CONTROLLER AND MONITOR.
2. FOR EXTERNAL CONNECTION REFER TO DRAWING NE-024, "ELECTRICAL & CONTROL WIRING DIAGRAM."
3. TERMINAL BLOCKS SHALL BE ALLEN-BRADLEY #1432-CA1 OR APPROVED EQUAL.

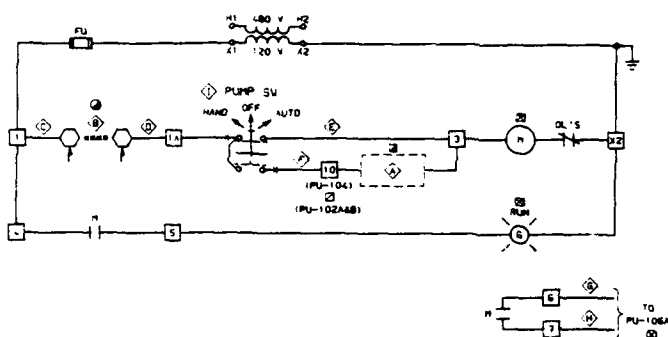
11" x 17"	DEPT. ARCH. CIV./STR. MECH. ELECTR. INSTR. PIPING SAFETY	REV. A 01	SCALE 1/4"=1'-0"	DATE 06/23/88	DESIGNED BY <i>[Signature]</i> CHECKED BY <i>[Signature]</i> CLIENT APPROVALS	JOHNSON-KNUDSEN ENGINEERS, INC. A PROFESSIONAL ENGINEERING FIRM	SHELL OIL COMPANY ROCKY MOUNTAIN ARSENAL REMEDIATION PROJECT INTERIM RESPONSE ACTION FINAL DETAILED DESIGN	WORK ORDER NO. 2127	30 x 42	
						DRAWING TITLE BASIN A NECK IRA INSTRUMENT CONTROL PANEL LAYOUT	DRAWING NO. 373-37-020		REFERENCE NO. E-020	REV. C

480 V FVNR STARTER
(START/STOP PUSHBUTTON STATION)



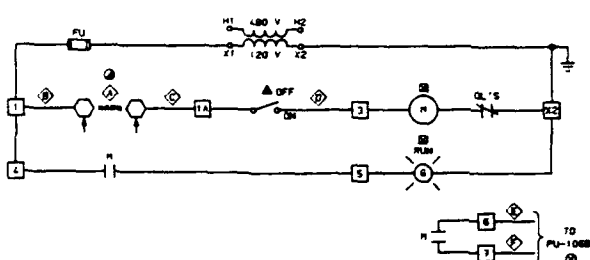
COPY NO.	EQUIP. DESCR.
PU-06A	FILTER HO FEED PU
PU-06B	FILTER HO FEED PU

120 V SINGLE-PHASE STARTER
(BYPASS-NORMAL CONTROL DEVICE)

[illegible]

WASTEWATER DECANT PUMP PU-102
(120 V SINGLE-PHASE STARTER)

480 V FVNR STARTER
(HAND-OFF-AUTO CONTROL STATION)

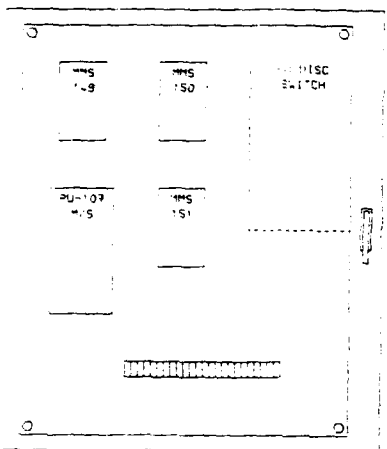
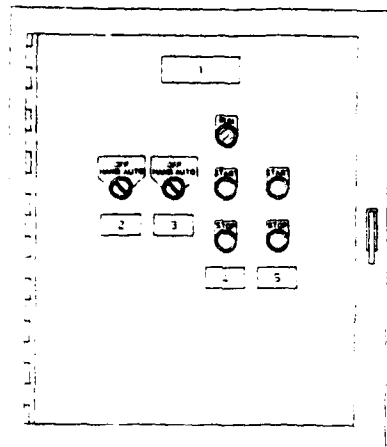
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WASTEWATER POLYMER FEED PUMP PU-105
: 120 V SINGLE-PHASE STARTER)

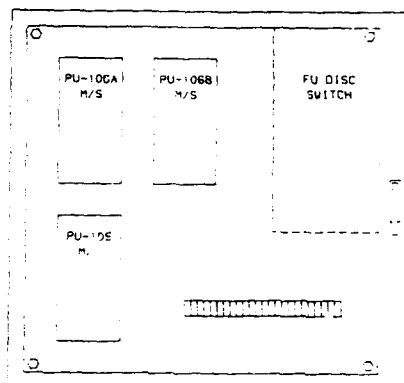
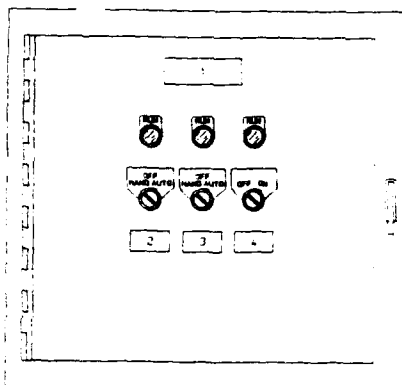
480 V FNVR STARTER
(OFF-ON CONTROL DEVICE)

REFERENCE TAGS E-020 PROCESS & INSTRUMENTATION DIAGRAM (P&ID) E-024 ELECTRICAL AND CONTROL WIRING DIAGRAM E-010 WELLS POWER & CONTROL LAYOUT E-002 ELECTRICAL ONE-LINE LAYOUT DRAWING NO. TITLE	REVISIONS NO. BY DATE CHG DESCRIPTION	REVISIONS NO. BY DATE CHG DESCRIPTION	APPROVALS DEPT REV1 A B C ARCH CIV/STR MECH ELECT JMC JMC JMC INSTR JEN JEN JEN PIPING DLS DLS SAFETY JC JL DEPT JEN JEN JEN REV JEN JEN JEN	SCALE DRAWN BY DESIGNED CHECKED REV
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ECP-102 ☐



QTY	DESCRIPTION
	HOFFMAN A-304S2508LP V-130P21 & A-B 0530 FUSED DISC SW
1	MOTOR HUMIDITY SENSOR (HMS) SUPPLIED BY MOTOR MANUFACTURER & INSTALLED BY CONTRACTOR
2	ALLEN-BRADLEY 3-POSITION SEL SW. BOOH-4RA & "M-O-A" PLATE (SPRING RETURN FROM HAND)
1	ALLEN-BRADLEY SINGLE-PHASE STARTER. 50S-A0XD & FUSE
2	ALLEN-BRADLEY PUSHBUTTONS. BOOH-4RA & "START" PLATE
1	ALLEN-BRADLEY PUSHBUTTONS. BOOH-4RA & "STOP" PLATE
1	ALLEN-BRADLEY INDICATING LT. BOOH-PI66 & "RUN" PLATE
1	ALLEN-BRADLEY TERMINAL BLOCKS. CAT #1-52-CA1
NR	NAMESPLATES:
	1 - ECP-102
	2 - FEED PUMP
	PL-102A
	3 - FEED PUMP
	PL-102B
	4 - WASTEWATER DECANT PUMP
	PL-107
	5 - FLOCCULATOR
	MZ-01

ECP-103 

QTY	DESCRIPTION
1	HOFFMAN A-24452508LP V/A-24P24 & A-8 DS30 FUSED DISC SV
1	ALLEN-BRADLEY SINGLE-PHASE STARTERS 509-AD30 & FUSE
2	ALLEN-BRADLEY 3-POSITION SEL SV. 800H-JR24 & "M-D-A" PLATE
1	ALLEN-BRADLEY 2-POSITION SEL SV. 800H-HR28 & "OFF-ON" PLATE
3	ALLEN-BRADLEY INDICATING LTS. 800H-PR166 & "RUN" PLATE
AR	ALLEN-BRADLEY TERMINALS. CAT #1842-CA1
AR	NAMENPLATES:
	1 - ECP-103
	2 - FILTER POLYMER FEED PUMP
	PU-106A
	3 - FILTER POLYMER FEED PUMP
	PU-106B
	4 - WASTEWATER POLYMER FEED PUMP
	PU-105

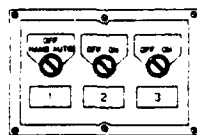
ECP-104 ▲



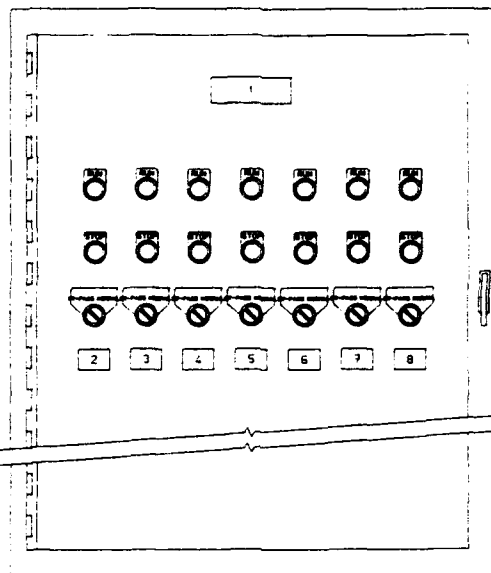
QTY	DESCRIPTION
1	HOFFMAN A-1066LF 4/2-8PS
1	ALLEN-BRADLEY 3-POSITION SEL SV. 800M-A2A & "H-D-A" PLATE
2	ALLEN-BRADLEY 2-POSITION SEL SV. 800M-HR2B & "OFF-ON" PLATE
AR	NAMEPLATES:
	1 - UTILITY WATER PUMP PU-104
	2 - POST FILTER INFLUENT PUMP PU-103A
	3 - POST FILTER INFLUENT PUMP PU-103B

[illegible]

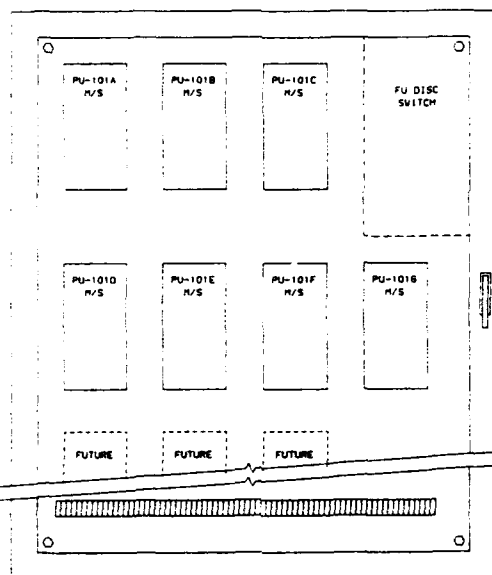
ECP-104 A



ECP-105



QTY	DESCRIPTION
1	HOFFMAN A-1088JFS V/A-SPS
1	ALLEN-BRADLEY 3-POSITION SEL SW. 800N-JR2A & 'H-O-A' PLATE
2	ALLEN-BRADLEY 2-POSITION SEL SW. 800N-JR2B & 'OFF-ON' PLATE
NR	NAMEPLATES:
1	UTILITY WATER PUMP
	PU-104
2	POST FILTER INFLUENT PUMP
	PU-103A
3	POST FILTER INFLUENT PUMP
	PU-103B



QTY	DESCRIPTION
1	HOFFMAN A-12853112LP V/A42P30 & A-B DS30 PU DISC SW
2	ALLEN-BRADLEY SINGLE-PHASE STARTERS 500-A0X0 & FUSE
2	ALLEN-BRADLEY INDICATING LTS. 800N-PR166 & 'RUN' PLATE
2	ALLEN-BRADLEY INDICATING LTS. 800N-PR166 & 'STOP' PLATE
2	ALLEN-BRADLEY 2-POSITION SEL SW. 800N-JR2B, 'BYPASS'-'NORMAL' PLATE & SPRING RETURN FROM 'BYPASS' TO 'NORMAL'
NR	ALLEN-BRADLEY TERMINAL BLOCKS- CAT 81482-CA1
NR	NAMEPLATES:
1	ECP-105
2	WELL PUMP
	PU-101A
2	WELL PUMP
	PU-101B
4	WELL PUMP
	PU-101C
5	WELL PUMP
	PU-101D
6	WELL PUMP
	PU-101E
7	WELL PUMP
	PU-101F
8	WELL PUMP
	PU-101G

NOTES:

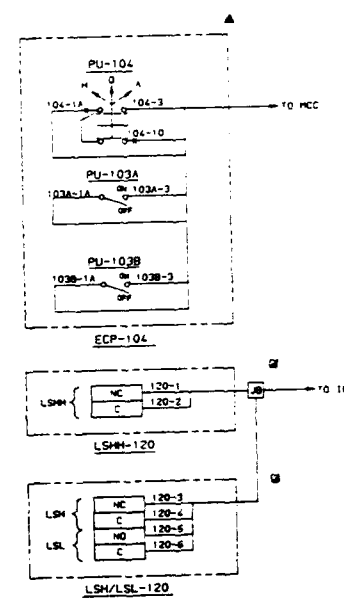
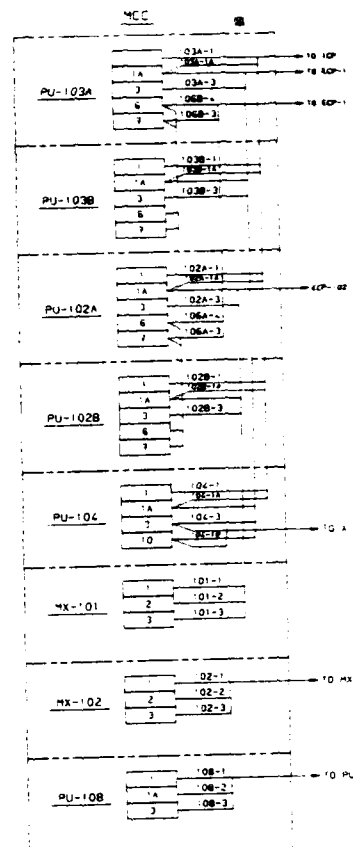
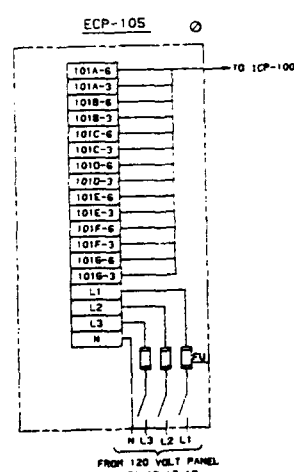
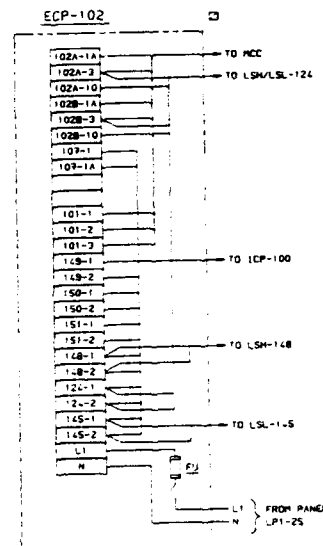
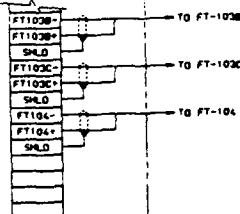
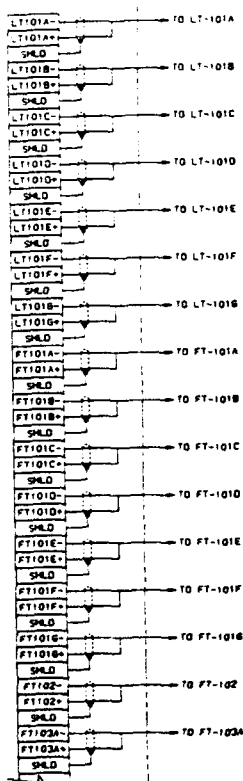
- CONTRACTOR SHALL CONFIRM ELECTRICAL DESIGN BASED ON ACTUAL PURCHASED EQUIPMENT PRIOR TO CONSTRUCTION AND FABRICATION.

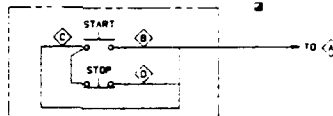
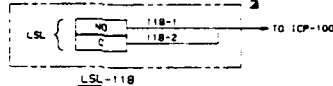
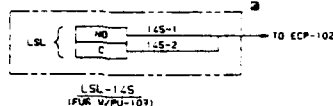
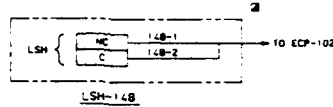
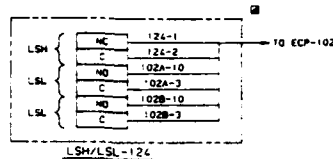
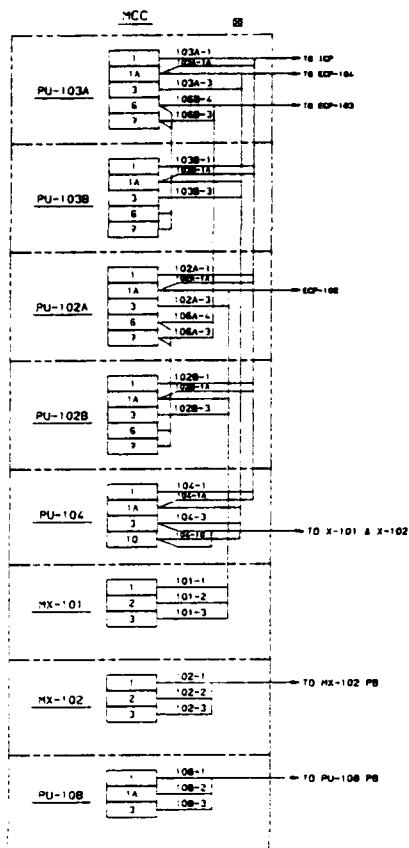
DEPT	REV	DATE	SCALE	DATE
AND	1	05/11/88	1/4" = 1'	05/11/88
CIV/STR	2	05/08/88	1/4" = 1'	05/08/88
MECH	3	05/11/88	1/4" = 1'	05/11/88
ELECT	4	05/11/88	1/4" = 1'	05/11/88
INSTR	5	05/11/88	1/4" = 1'	05/11/88
PIPING	6	05/11/88	1/4" = 1'	05/11/88
SAFETY	7	05/11/88	1/4" = 1'	05/11/88
DEPT	8	05/11/88	1/4" = 1'	05/11/88
PROJECT	9	05/11/88	1/4" = 1'	05/11/88

REV	BY	DATE
1	JJC	05/11/88
2	JJC	05/08/88
3	JJC	05/11/88
4	JJC	05/11/88
5	JJC	05/11/88
6	JJC	05/11/88
7	JJC	05/11/88
8	JJC	05/11/88
9	JJC	05/11/88

SHELL OIL COMPANY	
ROCKY MOUNTAIN ARSENAL REMEDIATION PROJECT	
INTERIM RESPONSE ACTION FINAL DETAILED DESIGN	
DRAWING TITLE	373-37-022
BASIN A NECK IRA	
ELECTRICAL CONTROL PANEL	
LAYOUT	

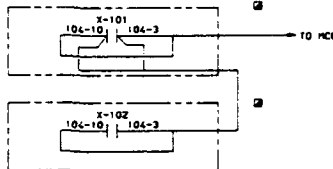
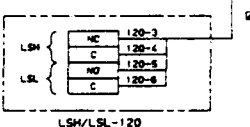
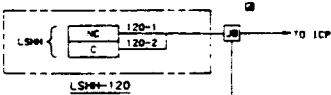
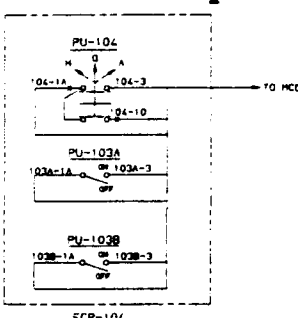
WORK ORDER NO.	REV
2127	30
DRAWING NO.	REV
373-37-022	42
REFERENCE NO.	REV
E-022	0

[illegible]



EQUIPMENT NO.	EQUIPMENT	TO (A)	WIRE NUMBERS
MX-102	POLYMER MIXER	MCC 102-1	102-2 102-3
PU-106	DRUM PUMP	MCC 106-1	106-2 106-3

TYPICAL START/STOP PUSHBUTTON STATION



BACKWASH CONTROL PANELS

LEGEND:

- - ECP-102 MOUNTED DEVICE
- - FIELD MOUNTED DEVICE
- - MICROPROCESSOR OR COMPUTER BASED SYSTEM. OUTPUT IN ICP-100
- ▲ - ECP-104 MOUNTED DEVICE
- ⊗ - ECP-103 MOUNTED DEVICE
- ⊞ - MCC MOUNTED DEVICE
- ⊙ - ECP-105 MOUNTED DEVICE

NOTES:

1. CONTRACTOR SHALL CONFIRM ELECTRICAL DESIGN BASED ON ACTUAL PURCHASED EQUIPMENT PRIOR TO CONSTRUCTION.

REVISION
APPROV
DATE

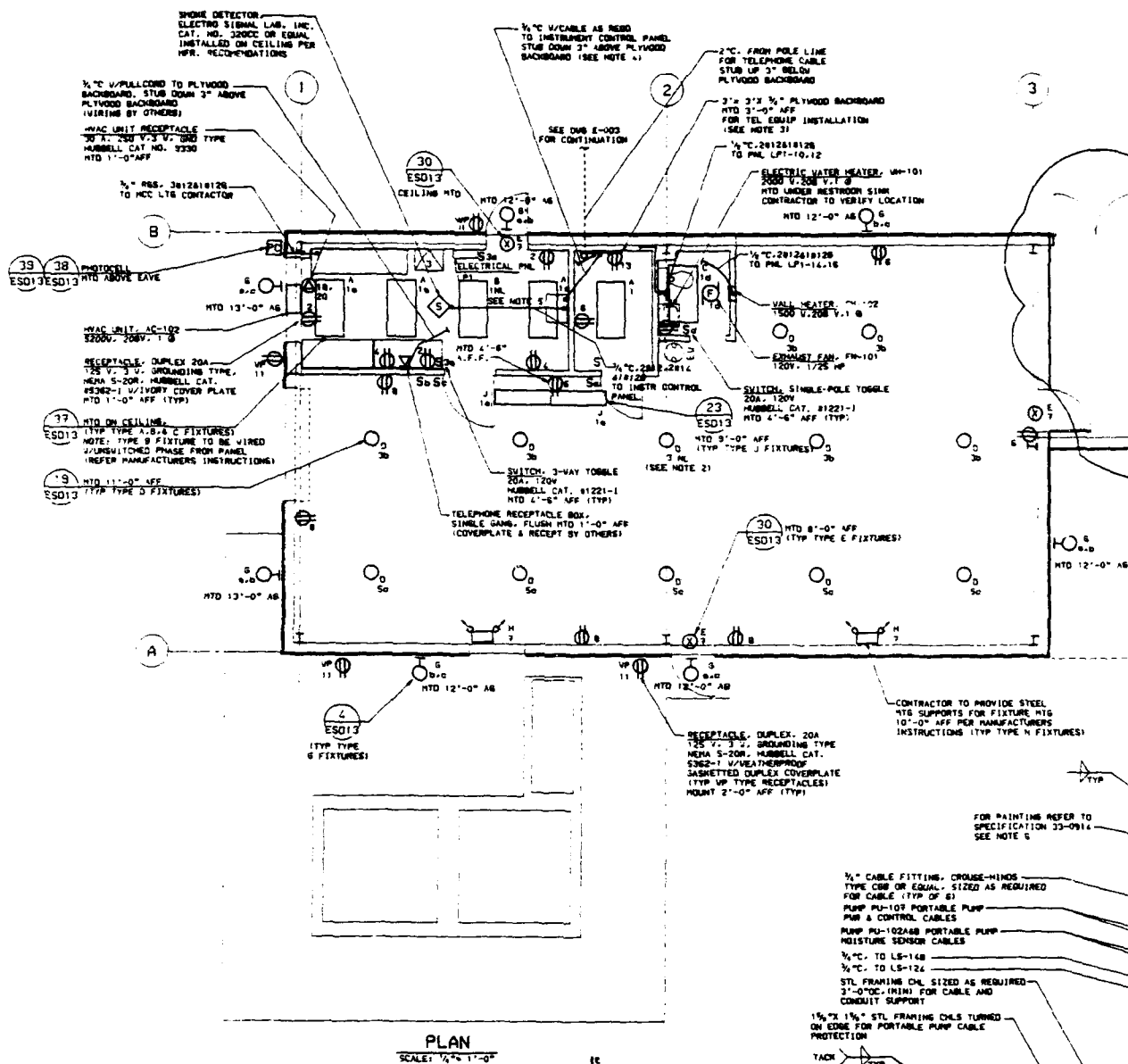
DEPT	REV	A	B	C
ARCH				
CIV/STR				
MED				
ELECT				
MECH				
PIPE				
SAFETY				
OTHER				

SCALE	DATE
DRAWN BY	5/8/89
DESIGNED BY	5/8/89
CHECKED BY	5/11/89
CLIENT APPROVALS	
REV	BY DATE

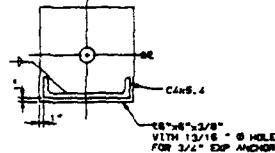
MORRISON-KNUDSEN ENGINEERS, INC.

SHELL OIL COMPANY
ROCKY MOUNTAIN ARSENAL REMEDIATION PROJECT
INTERIM RESPONSE ACTION FINAL DETAILED DESIGN
DRAWING TITLE
BASIN A NECK IRA
ELECTRICAL & CONTROL
WIRING DIAGRAM

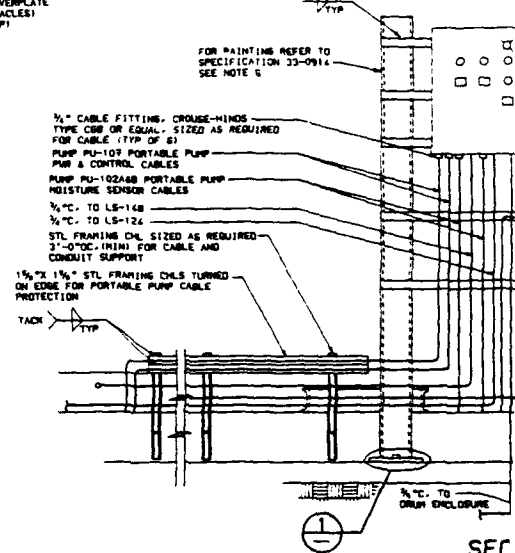
WORK ORDER NO.	2127	30
DRAWING NO.	373-37-024	42
REFERENCE NO.	E-024	REV
		0



PLAN
SCALE: 1/4" = 1'-0"



EQUIPMENT RACK MOUNTING DETAIL
DETAIL (1)
NTS

[illegible]

NON POLE LINE
PHONE CABLE
3" BELOW
BACKBOARD

3/4" PLYWOOD BACKBOARD
-0" AFF
EQUIP INSTALLATION
DTE 31

1212818126
A. LPT-10.12

ELECTRIC WATER HEATER, WH-101
2000 V.200 V.1 0
HTD UNDER RESTROOM SINK
CONTRACTOR TO VERIFY LOCATION

HTD 12'-0" AB

1212818126
3 PNL LPT-14.18

WALL HEATER, WH-102
2000 V.200 V.1 0

EXHAUST FAN, FH-101
20V. 1/25 HP

12CH. SINGLE-POLE TOGGLE
V.1-20V

BELL CAT. R1221-1
3 1/2" 6" AFF (TYP)

FF FIXTURES

HTD 8'-0" AFF

(TYP TYPE E FIXTURES)

HTD 12'-0" AB

HTD 12'-0" AB

HTD 12'-0" AB

HTD 12'-0" AB

HTD 12'-0" AB

HTD 12'-0" AB

HTD 12'-0" AB

HTD 12'-0" AB

HTD 12'-0" AB

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HTD 12'-0" AB

HTD 12'-0" AB

HTD 12'-0" AB

HTD 12'-0" AB

HTD 12'-0" AB

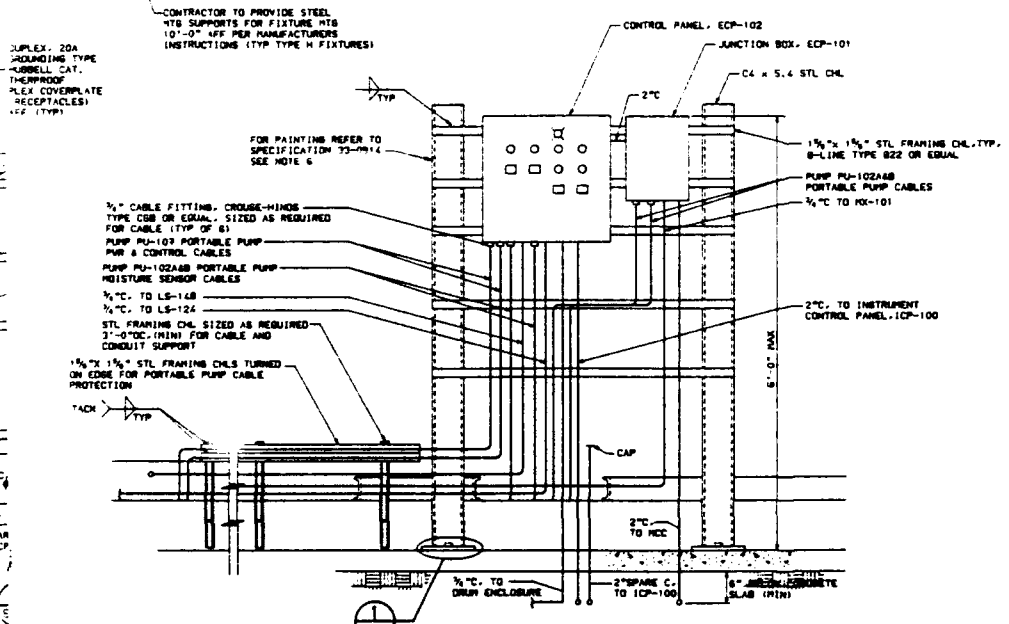
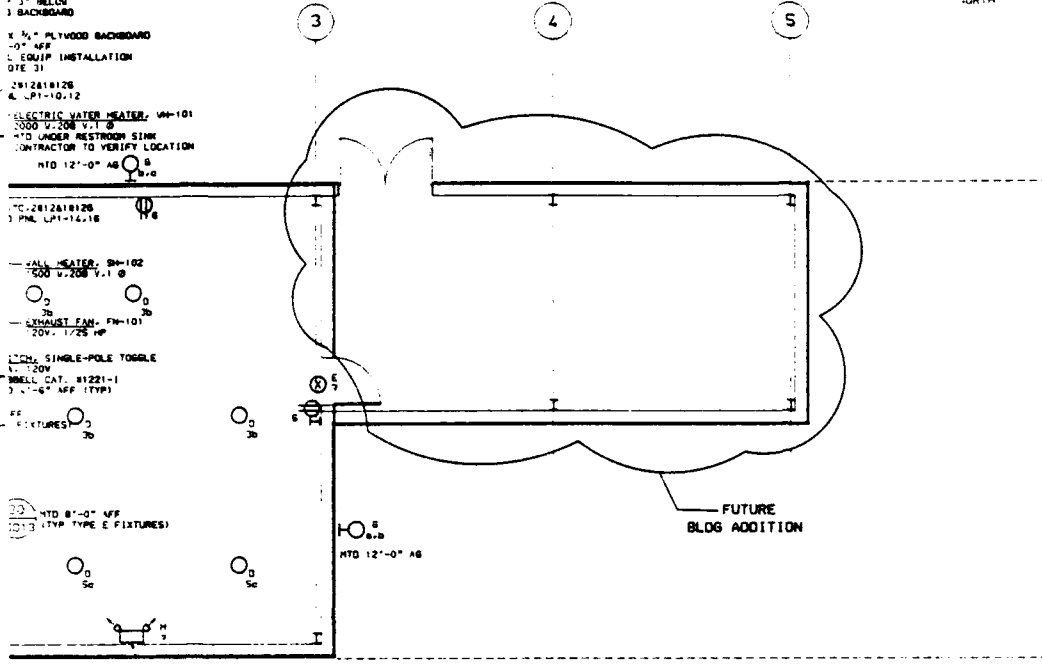
HTD 12'-0" AB

HTD 12'-0" AB

HTD 12'-0" AB

HTD 12'-0" AB

HTD 12'-0" AB



SECTION A-A
NTS E-028

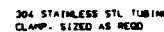
NOTES:

1. REFER TO SPECIFICATION 37-1801 FOR LIGHTING FIXTURE SCHEDULE, PANEL SCHEDULE, ELECTRICAL DETAILS AND GENERAL WORKMANSHIP AND MATERIALS.
2. NL - DESIGNATES FIXTURE TO BE WIRED AS A NIGHT LIGHT, BYPASSING THE SWITCH, DIRECTLY TO CIRCUIT BREAKER PANEL.
3. CONTRACTOR TO VERIFY ALL TELEPHONE EQUIPMENT REQUIREMENTS W/LOCAL TELEPHONE UTILITY PRIOR TO CONSTRUCTION. CABLE AND TELEPHONE EQUIPMENT TO BE FURNISHED AND INSTALLED BY OTHERS.
4. CONTRACTOR TO INSTALL CABLE AS REQUIRED BY LOCAL TELEPHONE UTILITY, FROM AUTO DIALER INSTRUMENTATION CONTROL CABINET TO TELEPHONE BACKBOARD. CONTRACTOR TO COORDINATE CONNECTION OF DIALER AND TELEPHONE SYSTEM WITH TELEPHONE UTILITY.
5. TYPE B FIXTURE INCLUDES SELF-CONTAINED BATTERY POWERED EMERGENCY LIGHTS.
6. CONTRACTOR TO PROVIDE PAINTING FOR ALL STRUCTURAL SUPPORT MEMBERS.

DEPT	REV	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
ARCH																											
CIV/STL																											
MECH																											
ELECT																											
INSTR																											
PIPING																											
SAFETY																											
DEPT	REV	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
PROJECT	REV	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z

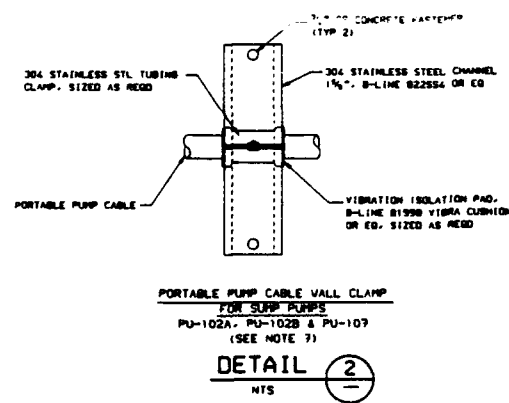
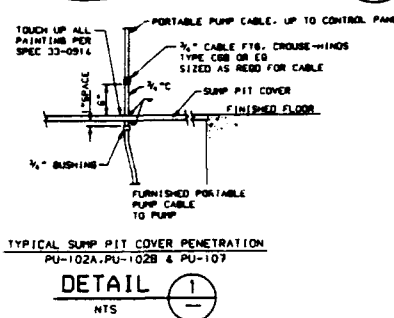
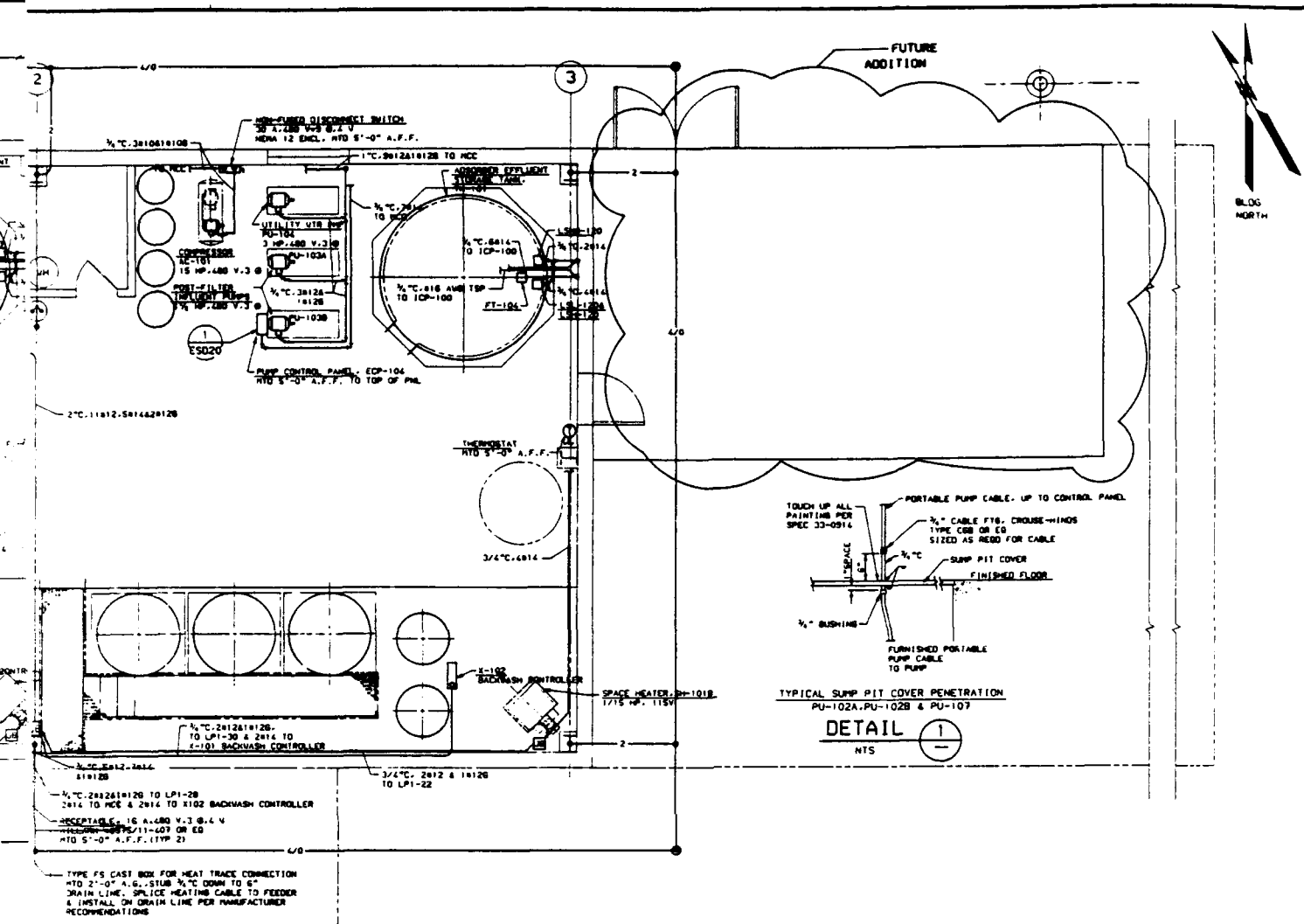
SCALE AS NOTED DATE
DRAWN BY E. BROWN 4/18/88
DESIGNED BY J.B. 04/18/88
CHECKED BY JPB 04/21/88
CLIENT APPROVALS
REV BY DATE

SHELL OIL COMPANY ROCKY MOUNTAIN ARSENAL REMEDIATION PROJECT INTERIM RESPONSE ACTION FINAL DETAILED DESIGN		WORK ORDER NO. 2127	30 X 48
DRAWING TITLE BASIN A NECK IRA GROUNDWATER TREATMENT BLDG ELEC PLAN & DETAILS, SHT #1		DRAWING NO. 373-37-027	REV 0
REFERENCE NO. E-027			



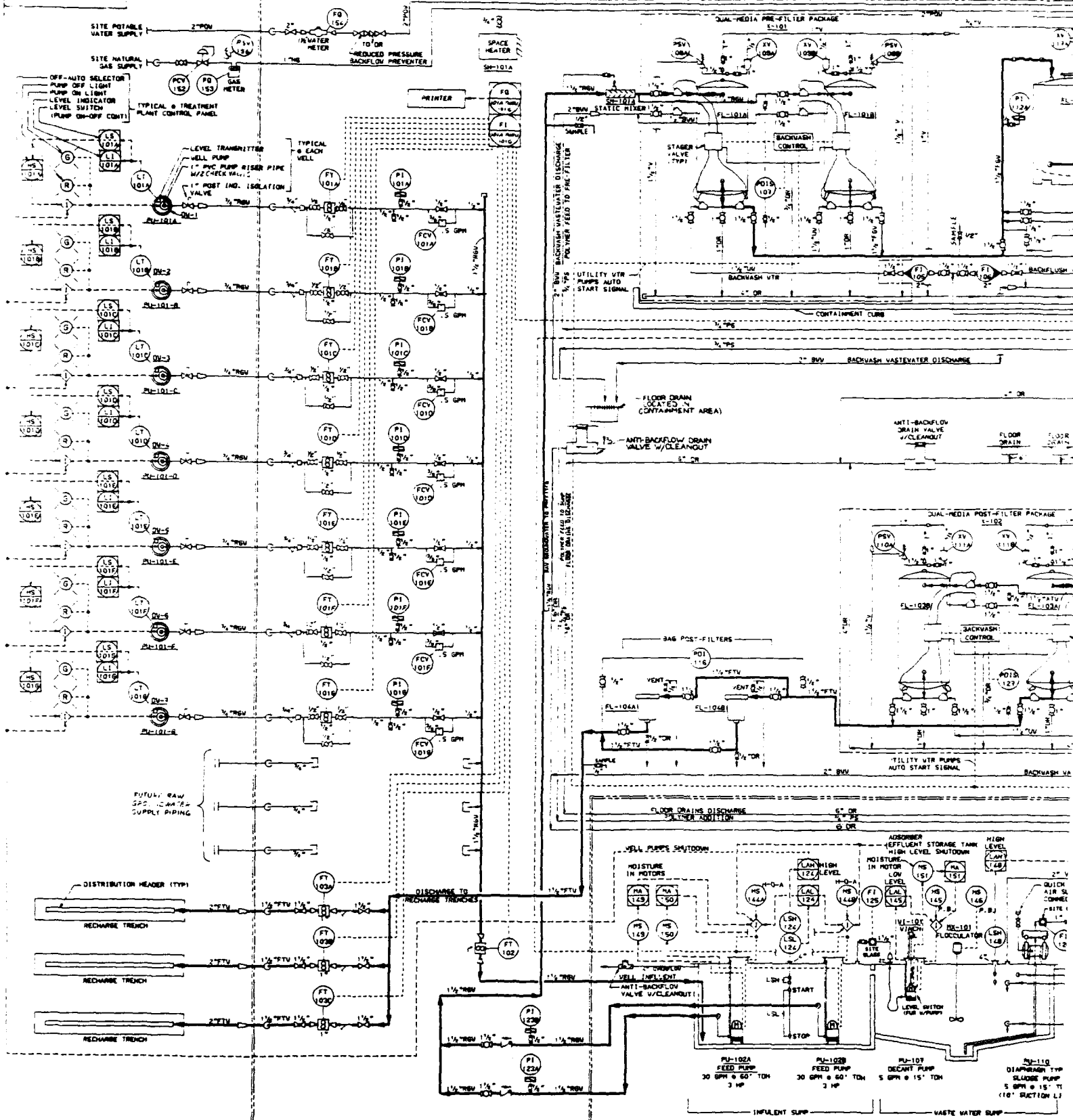
PORTABLE PUMP CABLE

[illegible]



- NOTES:**
1. REFER TO SPECIFICATION 33-1001 FOR LIGHTING FIXTURE SCHEDULE, PANEL SCHEDULE, ELECTRICAL DETAILS AND GENERAL WORKMANSHIP AND MATERIALS.
 2. CONTRACTOR TO DETERMINE AND VERIFY ALL CONDUIT STUB-UP LOCATIONS, BASED ON ACTUAL EQUIPMENT PURCHASED PRIOR TO CONDUIT INSTALLATION.
 3. SUPPLY 25 FT 3/4" & 1/2" SD CABLE, #12 AWG, WITH PLUS TO MATCH RESPECTIVE RPT, CONNECT TO MOTOR WITH APPROVED WATER-TIGHT CABLE CLAMP.
 4. ALL TWISTED SHIELDED PAIR SIGNAL WIRES ARE TO BE ROUTED IN SEPARATE CONDUITS FROM POWER AND CONTROL.
 5. CONTRACTOR SHALL VERIFY ELECTRICAL DESIGN WITH REQUIREMENTS OF ACTUAL EQUIPMENT PURCHASED AND WITH FIELD CONDITIONS, PRIOR TO CONSTRUCTION.
 6. CONTRACTOR TO CONSTRUCT EQUIPMENT RACK, EQUIPMENT SUPPORTS, AND CONDUIT AND CABLE SUPPORTS AS REQUIRED TO SUIT EQUIPMENT PURCHASED AND FIELD CONDITIONS.
 7. PORTABLE PUMP CABLE CLAMPS TO BE INSTALLED ON EACH SUMP PUMP CABLE, 2'-0" MAX. BELOW SUMP COVER PENETRATION.
 8. CONTRACTOR SHALL DESIGN HEAT TRACING SYSTEM TO PROVIDE FREEZE PROTECTION FOR EACH DRAIN LINE FROM BUILDING TO SUMP WELL AND PIPE OVER SUMP WELL AS INDICATED ON THE DRAWING. CONTRACTOR SHALL SUBMIT HEAT TRACE CALCULATIONS AND MATERIAL LIST TO ENGINEER FOR APPROVAL, PRIOR TO PURCHASE. REFER TO DWS P-020 & P-021 FOR PIPING INSULATION AND DETAILS.
 9. CONTRACTOR TO PROVIDE AND CONNECT ELECTRIC DOOR DISCONNECT SWITCH TO DOOR CONTROL PANEL PER MANUFACTURER RECOMMENDATIONS.

04/2	DEPT	REV	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU	AV	AW	AX	AY	AZ	BA	BB	BC	BD	BE	BF	BG	BH	BI	BJ	BK	BL	BM	BN	BO	BP	BQ	BR	BS	BT	BU	BV	BW	BX	BY	BZ	CA	CB	CC	CD	CE	CF	CG	CH	CI	CJ	CK	CL	CM	CN	CO	CP	CQ	CR	CS	CT	CU	CV	CW	CX	CY	CZ	DA	DB	DC	DD	DE	DF	DG	DH	DI	DJ	DK	DL	DM	DN	DO	DP	DQ	DR	DS	DT	DU	DV	DW	DX	DY	DZ	EA	EB	EC	ED	EE	EF	EG	EH	EI	EJ	EK	EL	EM	EN	EO	EP	EQ	ER	ES	ET	EU	EV	EW	EX	EY	EZ	FA	FB	FC	FD	FE	FF	FG	FH	FI	FJ	FK	FL	FM	FN	FO	FP	FQ	FR	FS	FT	FU	FV	FW	FX	FY	FZ	GA	GB	GC	GD	GE	GF	GG	GH	GI	GJ	GK	GL	GM	GN	GO	GP	GQ	GR	GS	GT	GU	GV	GW	GX	GY	GZ	HA	HB	HC	HD	HE	HF	HG	HH	HI	HJ	HK	HL	HM	HN	HO	HP	HQ	HR	HS	HT	HU	HV	HW	HX	HY	HZ	IA	IB	IC	ID	IE	IF	IG	IH	II	IJ	IK	IL	IM	IN	IO	IP	IQ	IR	IS	IT	IU	IV	IW	IX	IY	IZ	JA	JB	JC	JD	JE	JF	JG	JH	JI	IJ	JK	KL	KM	KN	KO	KP	KQ	KR	KS	KT	KU	KV	KW	KX	KY	KZ	LA	LB	LC	LD	LE	LF	LG	LH	LI	LJ	LK	LM	LN	LO	LP	LQ	LR	LS	LT	LU	LV	LW	LX	LY	LZ	MA	MB	MC	MD	ME	MF	MG	MH	MI	MJ	MK	ML	MM	MN	MO	MP	MQ	MR	MS	MT	MU	MV	MW	MX	MY	MZ	NA	NB	NC	ND	NE	NF	NG	NH	NI	NJ	NK	NL	NM	NN	NO	NP	NQ	NR	NS	NT	NU	NV	NW	NX	NY	NZ	OA	OB	OC	OD	OE	OF	OG	OH	OI	OJ	OK	OL	OM	ON	OO	OP	OQ	OR	OS	OT	OU	OV	OW	OX	OY	OZ	PA	PB	PC	PD	PE	PF	PG	PH	PI	PJ	PK	PL	PM	PN	PO	PP	PQ	PR	PS	PT	PU	PV	PW	PX	PY	PZ	QA	QB	QC	QD	QE	QF	QG	QH	QI	QJ	QK	QL	QM	QN	QO	QP	QQ	QR	QS	QT	QU	QV	QW	QX	QY	QZ	RA	RB	RC	RD	RE	RF	RG	RH	RI	RJ	RK	RL	RM	RN	RO	RP	RQ	RR	RS	RT	RU	RV	RW	RX	RY	RZ	SA	SB	SC	SD	SE	SF	SG	SH	SI	SJ	SK	SL	SM	SN	SO	SP	SQ	SR	SS	ST	SU	SV	SW	SX	SY	SZ	TA	TB	TC	TD	TE	TF	TG	TH	TI	TJ	TK	TL	TM	TN	TO	TP	TQ	TR	TS	TU	TV	TW	TX	TY	TZ	UA	UB	UC	UD	UE	UF	UG	UH	UI	UJ	UK	UL	UM	UN	UO	UP	UQ	UR	US	UT	UU	UV	UW	UX	UY	UZ	VA	VB	VC	VD	VE	VF	VG	VH	VI	VJ	VK	VL	VM	VN	VO	VP	VQ	VR	VS	VT	VU	VV	VW	VX	VY	VZ	WA	WB	WC	WD	WE	WF	WG	WH	WI	WJ	WK	WL	WM	WN	WO	WP	WQ	WR	WS	WT	WU	WV	WW	WX	WY	WZ	XA	XB	XC	XD	XE	XF	XG	XH	XI	XJ	XK	XL	XM	XN	XO	XP	XQ	XR	XS	XT	XU	XV	XW	XX	XY	XZ	YA	YB	YC	YD	YE	YF	YG	YH	YI	YJ	YK	YL	YM	YN	YO	YP	YQ	YR	YS	YT	YU	YV	YW	YX	YY	YZ	ZA	ZB	ZC	ZD	ZE	ZF	ZG	ZH	ZI	ZJ	ZK	ZL	ZM	ZN	ZO	ZP	ZQ	ZR	ZS	ZT	ZU	ZV	ZW	ZX	ZY	ZZ	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU	AV	AW	AX	AY	AZ	BA	BB	BC	BD	BE	BF	BG	BH	BI	BJ	BK	BL	BM	BN	BO	BP	BQ	BR	BS	BT	BU	BV	BW	BX	BY	BZ	CA	CB	CC	CD	CE	CF	CG	CH	CI	CJ	CK	CL	CM	CN	CO	CP	CQ	CR	CS	CT	CU	CV	CW	CX	CY	CZ	DA	DB	DC	DD	DE	DF	DG	DH	DI	DJ	DK	DL	DM	DN	DO	DP	DQ	DR	DS	DT	DU	DV	DW	DX	DY	DZ	EA	EB	EC	ED	EE	EF	EG	EH	EI	EJ	EK	EL	EM	EN	EO	EP	EQ	ER	ES	ET	EU	EV	EW	EX	EY	EZ	FA	FB	FC	FD	FE	FF	FG	FH	FI	FJ	FK	FL	FM	FN	FO	FP	FQ	FR	FS	FT	FU	FV	FW	FX	FY	FZ	GA	GB	GC	GD	GE	GF	GG	GH	GI	GJ	GK	GL	GM	GN	GO	GP	GQ	GR	GS	GT	GU	GV	GW	GX	GY	GZ	HA	HB	HC	HD	HE	HF	HG	HH	HI	HJ	HK	HL	HM	HN	HO	HP	HQ	HR	HS	HT	HU	HV	HW	HX	HY	HZ	IA	IB	IC	ID	IE	IF	IG	IH	II	IJ	IK	IL	IM	IN	IO	IP	IQ	IR	IS	IT	IU	IV	IW	IX	IY	IZ	JA	JB	JC	JD	JE	JF	JG	JH	JI	IJ	JK	KL	KM	KN	KO	KP	KQ	KR	KS	KT	KU	KV	KW	KX	KY	KZ	LA	LB	LC	LD	LE	LF	LG	LH	LI	LJ	LK	LM	LN	LO	LP	LQ	LR	LS	LT	LU	LV	LW	LX	LY	LZ	MA	MB	MC	MD	ME	MF	MG	MH	MI	MJ	MK	ML	MM	MN	MO	MP	MQ	MR	MS	MT	MU	MV	MW	MX	MY	MZ	NA	NB	NC	ND	NE	NF	NG	NH	NI	NJ	NK	NL	NM	NN	NO	NP	NQ	NR	NS	NT	NU	NV	NW	NX	NY	NZ	OA	OB	OC	OD	OE	OF	OG	OH	OI	OJ	OK	OL	OM	ON	OO	OP	OQ	OR	OS	OT	OU	OV	OW	OX	OY	OZ	PA	PB	PC	PD	PE	PF	PG	PH	PI	PJ	PK	PL	PM	PN	PO	PP	PQ	PR	PS	PT	PU	PV	PW	PX	PY	PZ	QA	QB	QC	QD	QE	QF	QG	QH	QI	QJ	QK	QL	QM	QN	QO	QP	QQ	QR	QS	QT	QU	QV	QW	QX	QY	QZ	RA	RB	RC	RD	RE	RF	RG	RH	RI	RJ	RK	RL	RM	RN	RO	RP	RQ	RR	RS	RT	RU	RV	RW	RX	RY	RZ	SA	SB	SC	SD	SE	SF	SG	SH	SI	SJ	SK	SL	SM	SN	SO	SP	SQ	SR	SS	ST	SU	SV	SW	SX	SY	SZ	TA	TB	TC	TD	TE	TF	TG	TH	TI	TJ	TK	TL	TM	TN	TO	TP	TQ	TR	TS	TU	TV	TW	TX	TY	TZ	UA	UB	UC	UD	UE	UF	UG	UH	UI	UJ	UK	UL	UM	UN	UO	UP	UQ	UR	US	UT	UU	UV	UW	UX	UY	UZ	VA	VB	VC	VD	VE	VF	VG	VH	VI	VJ	VK	VL	VM	VN	VO	VP	VQ	VR	VS	VT	VU	VV	VW	VX	VY	VZ	WA	WB	WC	WD	WE	WF	WG	WH	WI	WJ	WK	WL	WM	WN	WO	WP	WQ	WR	WS	WT	WU	WV	WW	WX	WY	WZ	XA	XB	XC	XD	XE	XF	XG	XH	XI	XJ	XK	XL	XM	XN	XO	XP	XQ	XR	XS	XT	XU	XV	XW	XX	XY	XZ	YA	YB	YC	YD	YE	YF	YG	YH	YI	YJ	YK	YL	YM	YN	YO	YP	YQ	YR	YS	YT	YU	YV	YW	YX	YY	YZ	ZA	ZB	ZC	ZD	ZE	ZF	ZG	ZH	ZI	ZJ	ZK	ZL	ZM	ZN	ZO	ZP	ZQ	ZR	ZS	ZT	ZU	ZV	ZW	ZX	ZY	ZZ	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU	AV	AW	AX	AY	AZ	BA	BB	BC	BD	BE	BF	BG	BH	BI	BJ	BK	BL	BM	BN	BO	BP	BQ	BR	BS	BT	BU	BV	BW	BX	BY	BZ	CA	CB	CC	CD	CE	CF	CG	CH	CI	CJ	CK	CL	CM	CN	CO	CP	CQ	CR	CS	CT	CU	CV	CW	CX	CY	CZ	DA	DB	DC	DD	DE	DF	DG	DH	DI	DJ	DK	DL	DM	DN	DO	DP	DQ	DR	DS	DT	DU	DV	DW	DX	DY	DZ	EA	EB	EC	ED	EE	EF	EG	EH	EI	EJ	EK	EL	EM	EN	EO	EP	EQ	ER	ES	ET	EU	EV	EW	EX	EY	EZ	FA	FB	FC	FD	FE	FF	FG	FH	FI	FJ	FK	FL	FM	FN	FO	FP	FQ	FR	FS	FT	FU	FV	FW	FX	FY	FZ	GA	GB	GC	GD	GE	GF	GG	GH	GI	GJ	GK	GL	GM	GN	GO	GP	GQ	GR	GS	GT	GU	GV	GW	GX	GY	GZ	HA	HB	HC	HD	HE	HF	HG	HH	HI	HJ	HK	HL	HM	HN	HO	HP	HQ	HR	HS	HT	HU	HV	HW	HX	HY	HZ	IA	IB	IC	ID	IE	IF	IG	IH	II	IJ	IK	IL	IM	IN	IO	IP	IQ	IR	IS	IT	IU	IV	IW	IX	IY	IZ	JA	JB	JC	JD	JE	JF	JG	JH	JI	IJ	JK	KL	KM	KN	KO	KP	KQ	KR	KS	KT	KU	KV	KW	KX	KY	KZ	LA	LB	LC	LD	LE	LF	LG	LH	LI	LJ	LK	LM	LN	LO	LP	LQ	LR	LS	LT	LU	LV	LW	LX	LY	LZ	MA	MB	MC	MD	ME	MF	MG	MH	MI	MJ	MK	ML	MM	MN	MO	MP	MQ	MR	MS	MT	MU	MV	MW	MX	MY	MZ	NA	NB	NC	ND	NE	NF	NG	NH	NI	NJ	NK	NL	NM	NN	NO	NP	NQ	NR	NS	NT	NU	NV	NW	NX	NY	NZ	OA	OB	OC	OD	OE	OF	OG	OH	OI	OJ	OK	OL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